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A survey of commodity risk management instruments

Report by the UNCTAD secretariat

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Main abbreviations used:

BM&F	Bolsa de Mercadorias & Futuros
CBOT	Chicago Board of Trade
CFTC	Commodity Futures Trading Commission
CME	Chicago Mercantile Exchange
Comex	New York Commodity Exchange
CSCE	Coffee, Sugar and Cocoa Exchange
IPE	International Petroleum Exchange
Kanex	Agricultural Futures and Options Exchange
KLCE	Kuala Lumpur Commodity Exchange
LIBOR	London interbank offered rate
Liffe	London International Futures and Options Exchange
LME	London Metal Exchange
MATIF	Marché à terme international de France
NYCE	New York Commodity Exchange
NYMEX	New York Mercantile Exchange
OTC	over-the-counter
SICOM	Singapore Commodity Exchange
SIMEX	Singapore International Monetary Exchange

Preface

(i) Two trends have become apparent in commodity markets in recent years. First, the structure and functions of the international trading community have changed. With the improvement in information flows and communication systems, direct trade between producers and users of commodities has become increasingly simple, forcing traders to offer new added value. Not all have been able to do so, and many international trading houses have disappeared; in many markets, structures have become polarized, with large, diversified trading houses existing next to small niche-market players, and without room for medium-sized players. The second trend has been the increased use that firms, mostly from the developed countries, have made of sophisticated market-based instruments (such as forward and futures contracts, swaps and options) to protect themselves against the possibility of adverse price developments in the commodity markets of interest to them, while also protecting their financing decisions.

(ii) The developments in trading techniques offer commodity-exporting developing countries new opportunities to counter the fluctuations in the prices of their primary products. However, particularly because of the innovations continually being introduced in trading instruments, some entrepreneurs and officials in developing countries may not be acquainted with the current possibilities, nor with their advantages and disadvantages.

(iii) UNCTAD has been undertaking work in this area for a number of years.[1] These activities gained new momentum at UNCTAD VIII in February 1992, when Governments recognized the importance of exploring new approaches to minimizing the risks arising from commodity market fluctuations and called upon the UNCTAD secretariat to address this issue. Since then, the secretariat has undertaken a large number of studies, both to survey trends in commodity price risk management markets and the related issue of structured commodity finance, and to analyse more narrow issues of direct policy relevance to developing countries (a list of publications is annexed to this survey). In addition, in UNCTAD's technical cooperation programme, increased attention is being given to policy advice, awareness-raising and training in commodity trading, risk management and finance.

(iv) The purpose of this report is to provide government officials and others in developing countries with general background information on the different commodity risk management markets around the world and on the variety of instruments that are offered in these markets to reduce their price risks. It is hoped that this information will contribute to a better understanding of the potential of both these markets and these instruments. In view of the large demand for the first two issues of this report, published in March 1993 and December 1994, and as background material for a meeting of a group of experts to examine the usefulness and effectiveness for commodity-dependent countries of new tools (for risk management and collateralized finance), to be held in May 1998, it was decided to issue a new, updated and slightly expanded version. The Commodities Branch of the UNCTAD secretariat would welcome any suggestions from readers for improving the text so that it meets this objective as fully as possible.

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[1] See, for example, "Commodity exchanges and their impact on the trade of developing countries" (TD/B/C.1/248), 18 May 1983.

Introduction

1. The use of commodity-linked financial risk management instruments by commodity producers, traders and consumers, including processors, reflects the desire to obtain protection from uncertain adverse price movements and, in certain cases, to procure short-term finance. The higher and the more unpredictable the price volatility of a commodity, the greater the possibility of incurring losses or realizing gains on future sales or purchases of a commodity. The greater the share in an enterprise's earnings or in its production costs that a specific internationally traded commodity or commodities represent, the greater that enterprise's exposure to price risks. The main users of commodity-linked risk management instruments for price hedging purposes are trading firms and marketing departments of large producing and consuming firms, including processors. It appears that direct trade deals between commodity producers and consumers have increased in importance for many commodities in the last few years and that the volume of trade handled by traders has decreased, as has the number of traders. Less reliance on traders has meant that producers and consumers have become more directly exposed to coping with price risks themselves. When world market prices for a commodity fall, a commodity producer risks being unable to cover production costs; a commodity trader who buys commodities before reselling them runs the risk of not covering his purchasing costs. On the other hand a commodity processor faces price risks in respect of both his inputs and outputs, as the extent of his processing margin is dependent upon variations in the two prices. Generally speaking, the risk for the final consumer is to pay higher-than-expected prices for the commodity that he purchases. There are also price risks associated with the holding of inventories by exporters, traders and importers.

2. Instruments for managing commodity price risks are varied; they include stabilization programmes and funds (at the national or company level), marketing strategies involving the timing of sales and purchases, long-term contracts with fixed prices, forward contracts, the use of futures or options to hedge prices through commodity exchanges, and over-the-counter (OTC) markets and the use of swaps and commodity-linked bonds.

3. Risk management is usually applied to only a portion of a company's production, trade or consumption. The size of this part depends on that company's risk exposure and hedging strategy. A key element in any hedging strategy is to determine the desired level in the trade-off between risk and return. Although most companies may claim their objective is to "maximize returns", this involves an inherent contradiction, since maximizing returns implies accepting maximum risks. The costs involved in a hedging strategy can also be considerable because of the high leverage incorporated in the financial instruments discussed in this report.[2] The part of production, trade or consumption which is hedged mainly depends on the level of income flow an enterprise wants to ensure. In addition, the size of this part depends on whether or not the available means of assessing the level of risk at any time (the fundamentals of supply and demand, technical analysis and "psychological" factors) are perceived to be reliable, the relationship with and status of the enterprise's trading partners, and a number of other particular conditions (e.g. the marketing structure for the underlying commodity, the acceptable price level, the cost of using risk management instruments and flexibility of production or consumption).

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[2] Usually only an amount of between 5 and 10 per cent of the value of the instrument has to be deposited when it is purchased. Thus, a user's expenditures linked to the forced liquidation of a futures position caused by his inability to meet a margin call (the extra deposits required when the price moves against him) may be many times higher than the amount of the margin call.

4. Financial risk management instruments are available as standardized or tailor-made contracts. Standardized contracts are usually traded on commodity exchanges, whereas tailor-made contracts are traded over the counter directly between two market participants. Commodity exchanges are market places (exchange floors in cities like Chicago, Kuala Lumpur, London, New York, São Paulo or Tokyo,[3] or electronic networks with terminals - throughout the country or even internationally - linked to the central exchange) for the trading of commodity contracts: contracts which specify for a commodity a specific quality, a specific volume, and specific delivery times and procedures. With the standardization of contracts, the negotiation of contract specifications becomes unnecessary. This makes buying and selling faster and cheaper, and tends to result in a higher volume of transactions. On the commodity exchanges, hedgers can normally quite easily find a counterpart for their proposed sale or purchase of a contract because of the presence of both other hedgers who wish to take an opposite position and speculators. Speculators are market participants who are not covering the price risks linked to a physical transaction in a commodity, but who wish to make profits from their perceived correct anticipation of future price developments and for this are willing to take on a price risk.[4] Commodity exchange markets usually operate under specific government regulations designed to maintain their solvency and to ensure certain standards, and hence are subject to government supervisory authorities.

5. In the OTC market, on the other hand, contract specifications are not standardized: they are the outcome of a direct negotiation between two market participants and are tailored to suit the specific requirements of these participants for a specified period of time. Risk management contracts on this market are created and offered by a range of commodity trading houses (including the trading arms of large petroleum companies) and financial institutions (brokerage companies and private banks). As OTC contracts are traded directly between two parties, i.e. on a principal-to-principal basis, they cannot easily be traded or resold (however, due to the fast growth of the market in several key commodities, it has become increasingly easy to enter into offsetting agreements which, linked to the legally enforceable principle of "netting",[5] effectively means that positions can be closed out). OTC markets are currently not subject to any specific regulation, mainly because they are considered as directly related to physical trade and because participation is, to a large extent, limited to large companies and banks who do not need the same level of protection as small-scale participants on commodity exchanges.

6. The choice between using forward, futures or options contracts on organized exchanges and OTC contracts is a difficult one. Price formation in OTC markets is by nature not transparent and depends on the availability of necessary information and bargaining strength. Moreover, use of the OTC market involves a counterpart risk - will the counterpart fulfil his obligations? In contrast, on futures exchanges, prices are published for the types of contracts traded and a clearing house guarantees the fulfilment of contracts. An important difference between OTC and commodity

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[3] Nowadays electronic trading is becoming more important: most new exchanges which have started since 1990 have chosen this option. In this form of trading, trading takes place via a computer screen instead of an exchange floor.

[4] An enterprise with an interest in the physical market frequently operates as both a hedger and a speculator. Also nowadays on many markets a significant proportion of speculative transactions comes from large investment funds which are diversifying their investment risks by entering many markets.

[5] Netting is the practice of "adding up" the exposures of separate deals between two counterparties in case one of these defaults, for the purpose of the calculation of a "net" obligation. It avoids the risk that, in a bankruptcy proceeding, the non-defaulting party will be obliged to meet his payments in full, while the obligations of the defaulting party become part of its general debt.

exchanges is that the former provides contracts both for exchange-traded commodities (for example, coffee, cocoa, sugar, petroleum, aluminium and copper) and for other commodities (for example, wood, cobalt or coal). Product specifications, place of delivery and the period of reference can be different in an OTC contract from those in the standardized futures contract. Moreover, OTC contracts can be cheaper, in terms of commission costs, than exchange-traded instruments.[6]

7. It should be pointed out that an enterprise directly operating for its own account on an organized futures and options market may incur considerable costs; several full-time professionals and sophisticated communications equipment are needed, as well as access to costly information services. In a large number of cases, enterprises use these markets through an intermediary. There are different types of intermediaries, such as trading houses, brokerage houses, commission houses, banks or the hedging departments of other producers or consumers. For example, exports or imports can be hedged without paying any commission costs and without having to worry about margin payments by making a deal with one of the trading houses, many of which are represented on the futures exchanges, for a certain quantity of a commodity with the price linked to a futures price. The disadvantage of doing this is that the actions of the enterprise are fully known to the traders, who may take advantage of this knowledge. Nevertheless, this is probably the most common use made of risk management instruments by buyers and sellers of commodities. An enterprise can also use the services of brokers, commission houses or banks, an approach which has the advantage of anonymity. Alternatively, an enterprise can use the facilities of other companies which are large enough to be themselves active on the futures exchanges.

8. The use of different instruments is not mutually exclusive. Which instruments are chosen and how they are combined depends on the user's hedging strategy. In addition to the elements to be taken into consideration in the hedging strategy mentioned above, any potential user has to decide whether the instruments are to be primarily used for price-hedging, as part of a wider marketing strategy (such as establishing or maintaining longer-term trading relationships), or for price-hedging in combination with other financial deals, including raising investment funds. On the basis of these considerations, three types of market-based financial risk management instruments and their respective users may be distinguished (see figure 1 and, for more details, annex I).

(a) Forward contracts and OTC options which are primarily trade-related instruments; as these contracts incorporate high credit risks, they are used only when trading partners have mutual confidence in each other. Forward contracts can also help in obtaining short-term export financing.

(b) Futures and exchange-traded options, as well as swaps between banks and consumers, which are primarily price hedging instruments. Like forward contracts, futures contracts can be used to obtain short-term export financing.

(c) Swaps between intermediaries and producers, and commodity-linked loans and bonds, which are instruments through which, in many cases elements of price hedging are combined with financial deals. Swaps are often used to make the repayment of loans or investments more secure (although they are also used as pure hedging instruments), while the primary aim of commodity-linked loans and bonds is to raise finance.

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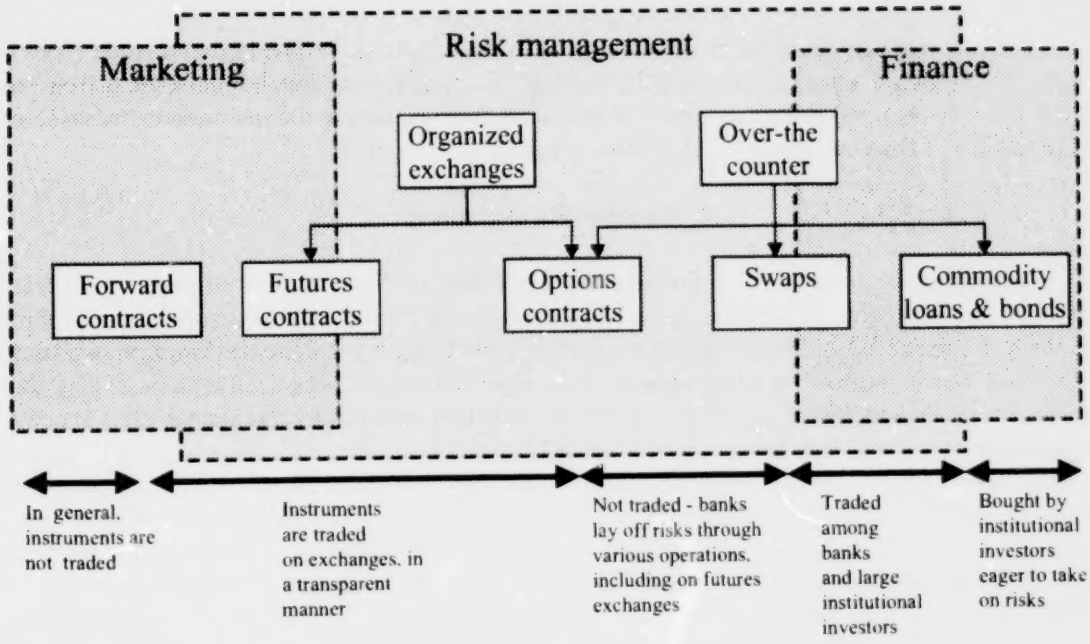
[6] This is often the case if a number of risks need to be hedged: for instance, an OTC contract covering a US$-denominated price risk for the export of a commodity which is to be paid in French francs is likely to be cheaper than covering the commodity and the currency risk separately with exchange-traded contracts.

Figure 1
Typology of risk management instruments


Risk management
Marketing
Finance
Organized exchanges
Over-the counter
Forward contracts
Futures contracts
Options contracts
Swaps
Commodity loans & bonds
In general, instruments are not traded
Instruments are traded on exchanges, in a transparent manner
Not traded - banks lay off risks through various operations, including on futures exchanges
Traded among banks and large institutional investors
Bought by institutional investors eager to take on risks

9. The trading of risk management contracts, particularly exchange-based futures and options, can play an important role in the price discovery mechanisms for the commodities involved. The prices of futures contracts over various contract months should provide a profile of expected future prices. When this is so, prices of futures contracts can be safely used in price negotiations for physical trade. However, there are several technical and regulatory conditions which need to be met simultaneously if futures prices are to reflect adequately and over time the underlying supply and demand conditions for the physical commodity. It should be pointed out here that several futures contracts may not currently satisfy these conditions.

10. Commodity-linked contracts were the backbone of business on futures exchanges until the late 1970s. Since then, the importance of financial futures has grown continuously and they now account for four-fifths of the total transaction volume on futures exchanges (up from two-thirds in 1990). Among the commodity-linked futures and options contracts, trading in fuels is by far the largest, followed by aluminium, copper, gold and silver. The volume of contracts traded for agricultural commodities, particularly soft commodities such as coffee, cocoa, cotton and sugar, are much smaller in absolute terms and the number of contracts traded displays strong year-to-year variations.

11. Commodity-linked, market-based financial risk management instruments can be used to lock in prices and thus contribute to reducing the exposure of participants in commodity markets to price risks, and they can improve price transparency. They do not, however, change price trends or levels on commodity markets. This implies that these instruments are a means of raising the predictability of an enterprise's future commodity-linked cash flow rather than a means of stabilizing commodity prices as such. In fact, one of the conditions for a risk management instrument such as a commodity futures contract to be viable is the existence of significant uncertainty about future prices for the underlying commodity.

Chapter I

COMMODITY PRICE RISK MANAGEMENT: THE MARKET PLACES

12. The risk management instruments reviewed in this report are traded in two distinct types of markets: commodity exchanges and the OTC market. To enhance understanding of the differences between these instruments and their uses, it is useful, before discussing the instruments themselves, to have an idea of the characteristics and functioning of these markets.

A. Commodity exchanges

13. A commodity exchange is a financial market where different groups of participants trade commodity-linked contracts, with the underlying objective of transferring exposure to commodity-price risks. Organized commodity futures exchanges have existed since the last century; organized options trade was introduced on a large scale in the early 1980s (some organized options trading took place in the 1920s and 1930s). The world's most important commodity exchanges are located in developed countries, and they bring important invisible foreign-exchange earnings to these countries. The major commodity futures exchanges are those of the United States of America (the Chicago Board of Trade (CBOT), the New York Mercantile Exchange (NYMEX), and the Coffee, Sugar and Cocoa Exchange" (CSCE)), the United Kingdom (the London Metal Exchange (LME), the International Petroleum Exchange (IPE) and the London International Financial Futures and Options Exchange (Liffe)), France (the "Marché à Terme International de France" (MATIF)) and the exchanges in Japan. These markets, especially those in the United States and the United Kingdom, provide the international benchmark prices for the commodities for which they offer contracts.

14. A number of developing countries have their own commodity futures exchanges (see also annex II). In Singapore, the Singapore International Monetary Exchange (SIMEX) has contracts in different fuels, which are traded quite extensively, and gold. The Singapore Commodity Exchange (SICOM - formerly the Rubber Association of Singapore Commodity Exchange) trades various rubber futures as well as robusta coffee. For non-fuel commodities, the Kuala Lumpur Commodity Exchange (KLCE) has the greatest international significance. Launched in 1980, it was the first futures exchange in Malaysia, offering contracts in crude palm oil. Another important exchange is Brazil's "Bolsa de Mercadorias & Futuros" (BM&F), where US$-denominated coffee, soybean, live cattle, feeder cattle, cotton, crystal sugar, corn and gold contracts are traded. Founded in 1854, the Buenos Aires Grain Exchange in Argentina is one of the oldest in the world; grain futures trade started in 1907. It trades wheat, maize, sunflowers and soyabeans contracts denominated in US dollars. In China, a large number of commodity futures exchanges have been created in recent years (see box 1), while in India, the long-established futures exchanges may be poised for a comeback on the international scene (see box 2).[7] Several countries with economies in transition, such as Hungary or Slovenia, also have domestically oriented commodity futures exchanges, while many other countries are considering the establishment of their own commodity exchanges.

15. Trading on a commodity exchange can take place in various ways. Open outcry is the most common. The other ways are the balancing method, often considered as a variation on open outcry;

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[7] See also L. Rutten, D. Umali-Deininger and B. Blarel, "Managing price risks in India's liberalized agriculture: can futures markets help?", World Bank/UNCTAD Report No. 15453-IN, November 1996.

Box 1

The emergence of commodity exchanges in China

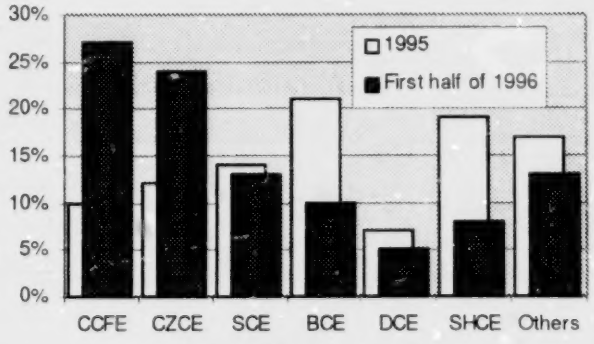
With the liberalization of China's internal market, the need arose for marketing and price discovery mechanisms for commodities which previously had price controls. A growing part of production, not only of farmers, but also of industrial companies, was sold on the free market, where processing companies were forced to obtain a gradually increasing proportion of their inputs. A central market place such as a forward or futures exchange was an obvious solution, and the Chinese Government started to study this possibility actively in 1988. The government expected exchanges to go from wholesale markets to forward markets, with futures markets as the final stage. However, actual developments surpassed expectations: Chinese companies showed great enthusiasm for this new form of trade.

The Zhengzhou Grain Wholesale Market in Henan was the first to start operating, in October 1990. When it proved a success, five other provincial grain markets were opened during 1991, trading such commodities as wheat, maize, mung beans and sesame seeds. Despite China's poor physical infrastructure and lack of knowledge of futures trading, the number of exchanges increased exponentially, and in late 1993 there were 30 futures exchanges (most using electronic trading systems), while 50 wholesale markets were keen to offer futures trading possibilities. There were at least three futures markets in base metals (Shanghai, Shenzhen and Jinpeng); one in gold (Shenzhen); three in fuels and/or petrochemicals (Shanghai, Daqing and Nanjing - the latter being cleared by the Hong Kong Futures Exchange); one rubber market, in Guangzhou; and seven cereals markets. There was also one "general" market trading agricultural products, metals, fibres and energy and chemical products, the Beijing Commodities Exchange, which was opened by the central government in early 1993 with the purpose of unifying the markets existing throughout the country. The largest of these markets was the Shanghai Metals Exchange, which started trading futures in copper, aluminium, lead, zinc and crude steel in February 1993 and had become, by late 1993, the world's third largest futures exchange in terms of contract turnover. The Government decided in 1993 that no more futures exchanges should be created, but with local governments competing vigorously over a slice of the futures pie, this central directive was not immediately effective. In late 1994, a more drastic decision was taken: more than half of China's exchanges were closed down or ordered to revert to being wholesale markets, while only 15 restructured exchanges received formal government approval. Futures trade in a number of strategic products (steel, coal, gasoline, diesel oil, sugar and cotton) as well as in most financial contracts was banned.

As can be seen in table 1, the Shanghai Metals exchange is no longer one of China's largest. In the first half of 1996, that honour went to the China Commodity Futures Exchange of Hainan, in Southern China, which principally trades coffee futures (indeed, in terms of number of contracts traded, it was the world's largest coffee futures exchange in 1996). The influence of both government policies and the shifting interests of speculators on exchange volume are very large. For example, the Beijing Commodity Exchange was the largest exchange in 1995, until the Government closed down its most popular contract, the contract in Treasury bills. Speculation still accounts for the major part of turnover on most exchanges, and speculators (who can nowadays easily use any of China's markets, through brokers or through exchange "satellites" in other towns) move with the tide of price volatility. Therefore, Government interventions which reduce the price volatility of a commodity (or supply/demand conditions which reduce price volatility) strongly reduce speculators' interest in trading the commodity's contract.

Table 1

Shares of China's main commodity exchanges in total futures turnover



Abbreviations:

BCE: Beijing Commodity Exchange
CCFE: China Commodity Futures Exchange
CZCE: China Zhengzhou Commodity Exchange
DCE: Dalian Commodity Exchange
SCE: Suzhou Commodity Exchange
SHCE: Shanghai Commodity Exchange

Box 1 (continued)

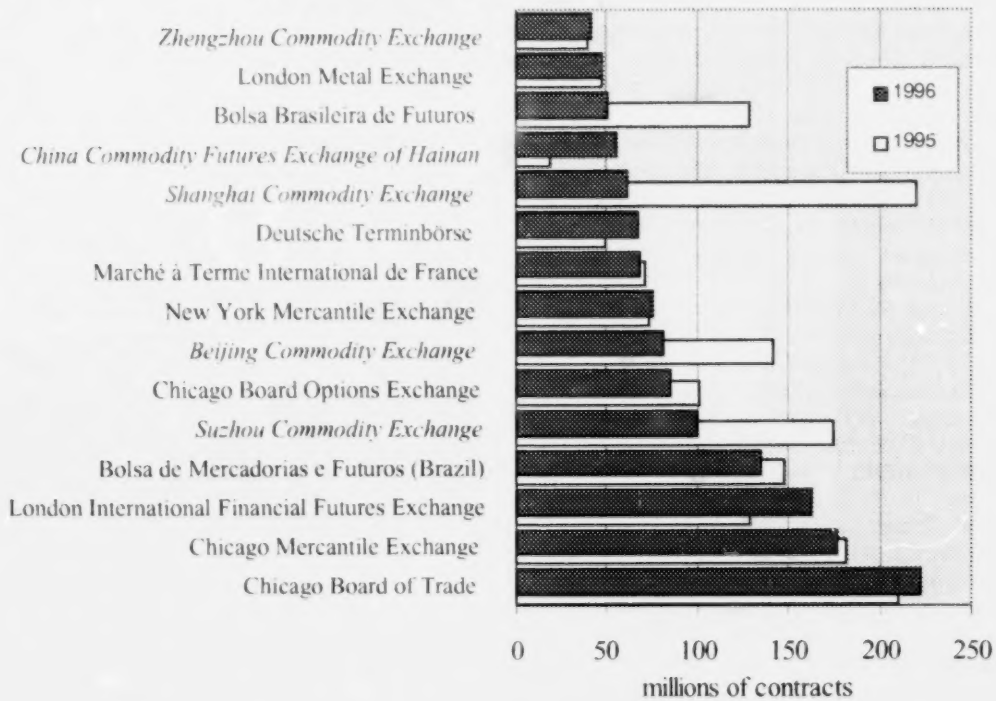
The emergence of commodity exchanges in China

Following the explosive growth of commodity futures markets throughout the country, the need for proper regulation made itself felt. During the early 1990s, the central government had virtually lost control over these markets, which were being regulated by provincial or even municipal authorities. Two particular problems arose: the duplication of efforts to initiate new contracts, diluting the liquidity of any one exchange, and the problem of poorly regulated intermediaries, with the threat of the emergence of "bucket shops". The central Government decided to regain control over the futures market by setting up a body for regulatory oversight, the Securities Regulatory Commission, in October 1992, by starting to draft a securities law which would also cover commodity futures (including the procedures for approval of new exchanges), and by adopting, in 1993, capital adequacy standards and an approval procedure for brokers.

As table 2 shows, Chinese exchanges are now among the world's largest. For example, China traded a total of 617 million futures and options contracts in 1996, as compared with the 234 million traded in the United Kingdom. It seems now that China is able to create an influx of foreign players. A considerable number of foreign companies (international banks, brokerages and metal companies, such as American Express, Merrill Lynch and Samsung) have expressed interest. The Shanghai exchange trades mostly the same commodities as the London Metal Exchange. Arbitrage by Chinese companies between the Shanghai and the London exchanges is already strong. Consequently, prices tend to move in tandem. If the Shanghai exchange was opened to foreign participation, this would allow foreign companies to hedge much closer to the time of their actual physical transactions and to undertake arbitrage transactions. Two American exchanges, the Chicago Board of Trade and the Chicago Mercantile Exchange, have provided much of the initial support for the development of the Chinese futures exchanges, in the hope that these exchanges will ultimately be linked up to the world economy through a globalized electronic trading system.

Table 2

Ranking of world futures exchanges,
in terms of 1996 contract turnover (Chinese exchanges in italics)



Box 2

Commodity exchanges in India

Commodity futures markets have a long history in India. The first organized futures market, for various types of cotton, appeared in 1921, when the Cotton Exchange was created in Bombay. A second exchange, the Seeds Traders Association Ltd, also in Bombay, was created in 1926; this exchange traded oilseeds and their products such as castorseed, groundnuts and groundnut oil. A multitude of other exchanges followed, trading such commodities as raw jute, jute products, pepper, turmeric, potatoes, sugar, food grains and gold. Several exchanges traded the same commodities, and some of these had formal trading links. A complete regulatory framework for futures trade was drafted, including rules and conditions for trading in futures, a system for the licensing of brokers and a clearing-house structure. In addition to futures, options on a number of commodities were traded on the exchanges; for example, options on cotton were traded up to one year out, until all options were banned in 1939.

In the 1940s, trading in forward and futures contracts as well as options was either outlawed, as part of the Government's drive to contain inflation, or made impossible through price controls. This was the situation until 1952, when the Government passed the Forward Contracts (Regulation) Act, which to this day controls all transferable forward contracts and futures. The Act allowed futures market trade in a number of commodities (but excluded some which were seen as essential foods, such as sugar and food grains). It provided that forward and futures markets should normally be self-regulating, through the governing bodies of recognized associations, in which the Government had the right to place several representatives. It was illegal to enter into futures contracts other than between, with or through the members of these recognized associations. The Forward Markets Commission was created to supervise and regulate markets from the point of view of public interest, but in fact, gradually absorbed the exchanges' self-regulatory powers.

During the 1960s, the Indian government either banned or suspended futures trading in several commodities, including cotton, raw jute, edible oilseeds and their products. In the early 1970s, futures trading in non-edible oilseeds like castorseed and linseed was forbidden. Even non-transferable forward contracts (contracts between two parties specifying delivery for a period beyond 11 days) were forbidden for a number of commodities. The reason for this crackdown on futures markets was that the Government considered that these markets helped to drive up prices for commodities, by giving free rein to speculators. In the same vein, restrictive measures directed at combating speculation were put in place which affected the activities of the 31 recognized associations which were supposed to regulate trade in commodity futures. Among other things, speculators were called upon to pay extra margins when regulators deemed it necessary; and trade in contracts was simply stopped for prolonged periods (skipping one or more normal delivery months) when prices hit certain ceilings.

The Government's policies softened somewhat in the late 1970s, when futures trade in gur, a sugar-cane product and as important as sugar on India's sweetener market, was allowed. Two government-appointed committees, in 1966 and 1979, recommended the revival of futures trading in a wide range of commodities, but little action resulted. In those commodities in which futures trade is allowed (pepper, turmeric, castorseed, potato and gur), turnover is relatively large, and a wide variety of groups (large farmers, domestic traders, exporters, brokers and speculators) are active. Contracts in most commodities are actively traded for periods up to six months out, and, as should be the case for mature futures markets, most contracts are used for hedging purposes, not for physical trade.

With the full convertibility of the rupee for commercial purposes, the ongoing process of economic liberalization and the Indian economy's opening to the world market, the role of futures markets in India is being reconsidered by the government. Most of the contracts being traded in India are unique in the world. Although some are clearly oriented to the domestic market, others (such as raw jute, pepper[a], and a range of oilseeds and oils proposed by the Bombay oilseeds exchange) have the potential to become of regional or even international importance. Several of the exchanges are interested in playing a more international role, and have requested the government, through the Forward Markets Commission, to assist them in this internationalization process.

In 1994, the latest expert committee, the Kabra Committee, recommended that the Government should approve the introduction or reintroduction of a range of commodity futures contracts. The implementation of the Committee's recommendations has been slow, but sure. The first new contract allowed was an international pepper futures contract, to be traded in Cochin, in southern India; the contract was officially launched in mid-1997. The Government has also approved new futures contracts, open for use by foreign companies, in cotton and castorseed oil, and has allowed a number of major State trading corporations to explore the possibility of using overseas futures markets. Pressure from the private sector to go further remains strong; proposals to introduce futures contracts for edible oils, coffee and sugar, among others, are all firmly supported by groups from industry.

[a] Preliminary work on the launch of a pepper futures contract was carried out by UNCTAD: see "Feasibility study on a worldwide pepper futures contract", UNCTAD/COM/64, October 1995.

electronic trading, or the use of a computer network; and the market-maker system.[8]

16. In an open-outcry system, a number of people are assembled during a trading session on a market floor, in general standing in a so-called "ring" designated for the trading of a particular commodity. They indicate by hand signals and by calling out (hence the name "open outcry") the orders they would like to place and the price. A trading session can last anything between five minutes and a few hours; during this period, prices move rapidly, rarely remaining stable for more than a very short while.

17. Those present on the floor can be divided broadly into those trading on their own account (the "locals" or "floor traders"), and those trading on behalf of a producer, consumer, trading house, bank or broker (the "floor brokers"). Locals are a traditional part of exchange activity in the United States, but in the United Kingdom they are a relatively recent phenomenon: Liffe's commodity department (until 1996 an independent exchange, then known as the London Commodity Exchange) only allowed locals in the mid-1980s, and they are still absent from the LME. Locals often contribute considerably to market liquidity: in markets as diverse as the New York CSCE and the KLCE, their share in the volume of trading is typically 30-40 per cent; on the CBOT, their share is estimated at 50 per cent. They rarely leave positions open overnight: they go in and out of trades during the same day. For locals, a personal presence in the trading ring, to find out what is happening and to maintain personal contacts with other brokers and traders, is very important. There is therefore no real place for them in systems of trading other than the open-outcry system.

18. The floor representatives of producers, consumers, trading houses, banks or brokers execute orders on behalf of their firms. A typical chain of events is as follows: a client (this may be, for example, an individual, a trading firm or another broker) gives an order to buy or sell to a commodity broker; the broker then calls his order station (if he is a member of the exchange - otherwise, he has to pass through another broker), where a telephone clerk records the order, noting the exact time. The order ticket is handed to a "runner", who carries it to the firm's floor broker in the trading ring. The broker executes the transaction, if possible, and notes its execution on the order ticket. The runner returns the ticket to the phone clerk, who records the exact time the order is executed and notifies the brokerage firm. The brokerage firm then notifies the customer, giving the exact price that has been obtained. The prices at which orders are executed are independently relayed to computer operators by exchange employees stationed in the trading ring. This allows instant, real-time reporting of exchange prices throughout the world.

19. Two elements of this process deserve special mention. First, the emphasis on the exact timing of all transactions. This is imperative for compliance reasons: when regulatory supervisors know the time of a transaction, they can easily check that the broker has not misused his information on a customer's order[9] and that the order was executed at the correct price. Second, the degree of activity of the phone clerk may divulge information on the trading intentions of the firm from which others can profit, which puts floor brokers of firms which do not take transactions from other firms at a disadvantage. For this reason many of the larger participants in international commodity trade are not

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[8] In practice, the open outcry system and electronic trading can be linked, with electronic trading taking over after hours, when ring-trading is closed.

[9] Brokers often not only execute trades on behalf of clients, but also trade on their own account, which is called "dual trading". This gives rise to a practice called "frontrunning", where brokers, once they get a customer order which they know will move the market, can decide to place their own orders before they place the orders on behalf of their client. The client thus gets a somewhat less favorable price.

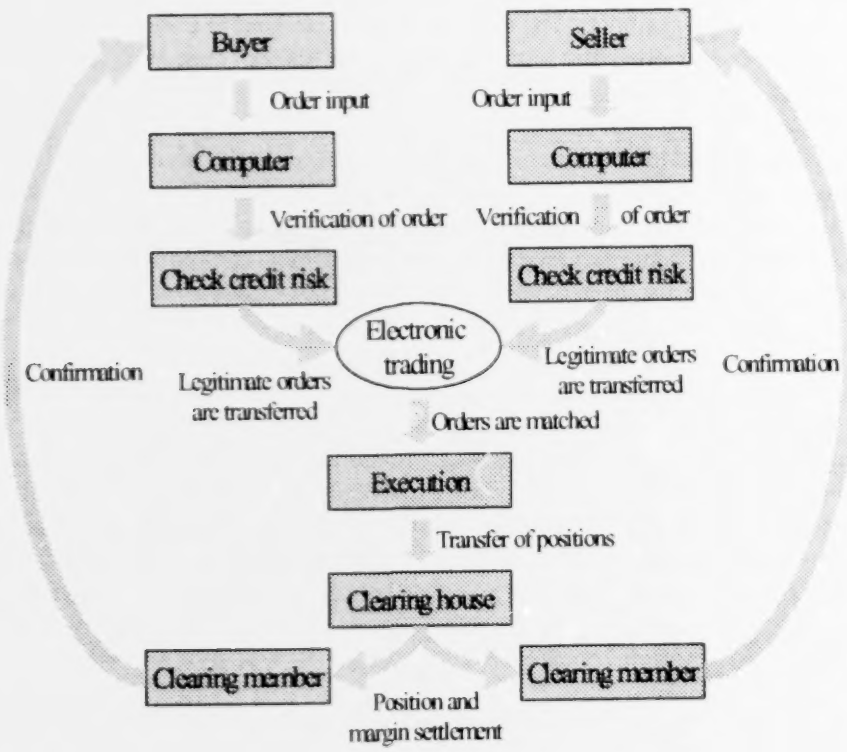
members of any of the commodity exchanges themselves, but act through brokers. In general, trading houses which have their own brokers on the floor spread out their orders over a large number of brokers not related to their firm so as not to broadcast their intentions.

20. The balancing method is used by a number of Japanese exchanges (principally for raw silk, textile yarns and rubber), and also in some spot markets such as the Kuala Lumpur Tin Market and the London OTC spot market for gold. It is basically a system whereby offer and demand are matched by an auctioneer. The auctioneer asks sellers which quantity they want to sell at a given price, and then asks buyers how much they would like to buy at this price. The price is adjusted until offer and demand are more or less in equilibrium; equilibrium is often reached within one to five minutes. All transactions take place at the resulting equilibrium price. Buyers and sellers may be assembled in a ring, or they may be in contact with the auctioneer by telephone.

21. In electronic trading, trading takes place through a computer system (see figure 2). Parties authorized to use the system put in the prices they are offering or asking, and can decide to pick up orders from the system; a central computer matches bids and offers. Outside Japan, this system is used for white sugar in London, rubber in Singapore and wool in New Zealand. In Japan, electronic trading is used on several: it is used for all trade on the Agricultural Futures and Options Exchange (Kanex, the exchange which resulted from the merger, in October 1993, of the Osaka Grain Exchange, the Osaka Sugar Exchange and the Kobe Grain Exchange) and the Tokyo Grain Exchange (the result of a merger, also in October 1993, between the Tokyo Sugar and Grain exchanges), and for the gold, silver, platinum and palladium contracts on the Tokyo Commodity Exchange.

Figure 2

Order and execution flows in electronic futures trade



22. Compared to the open outcry system, electronic trading has two major advantages, and two major disadvantages. One advantage is that trade is not necessarily restricted to limited times 24-hour trading becomes possible. The other advantage is that those directly trading onhe exchange no longer need to be physically present on the exchange floor: they can be anywhere in the world. In the late 1980s, these two advantages encouraged CBOT, Chicago Mercantile Exchange (CME) and Reuters to develop GLOBEX, a 24-hour world-wide computer network for futures and options trade. The success of GLOBEX has been limited, largely because it relies on technologies and programming techniques that are now outdated. Several other exchanges have developed alternative systems. If turnover is relatively large, and systems have been well conceived, electronic trading can have lower transaction costs than open-outcry trading.

23. One major disadvantage of the electronic trading system is that there are few opportunities for locals. Locals, as discussed above, depend to a large extent on their ability to interpret what they hear and see around them and on their relations with others in the trading ring. A computer-based system makes involvement in trading less attractive to locals. As locals provide a large part of the intra-day liquidity on futures exchanges, their disappearance is likely to result in traders having more problems in closing deals and thus being obliged to accept less favourable prices. A second disadvantage is that with 24-hour trading, trading activity and liquidity are necessarily low at certain times of the day, which means the market can be more easily manipulated at those times.

24. The fourth system for commodity exchange trade, the market-maker system, is most common in stock markets; it is also used by the SICOM. Market makers (seven large Singaporean and Japanese rubber trading firms) and clearing members (including a number of Japanese trading houses) are linked through a computerized trading network. Market makers are obliged to provide bid and ask quotes for a number of types of rubber for a number of contract months. The computerized system provides the market's best bids and offers, and a customer can pass his orders either directly through a market maker or through a clearing member. The market maker is obliged to trade with the customer for a price within the market's prevailing best bid/ask offer, even if his own quotations are different. Market makers can also trade among themselves.

25. The globalization and liberalization of world trade has led to the need to make cost savings and improve technological capacity. One of the best ways to deal with this issue is the development of strategic alliances - for marketing, trade in contracts and/or clearing operations. Many commodity exchanges have merged in recent years (see box 3). Strategic links, combining the open-outcry system with electronic trading, have also been developed and; this type of links are already relatively common in stock markets.[10]

26. Not everybody is allowed to trade on the exchanges. One can either become a member per se (the system at the LME, Liffe and KLCE), or buy one or more seats and thus become a member (the system of most other exchanges). If seats are sold, the number is always limited (for example, to 34 clearing members on the NYCE, 38 on the Bolsa de Mercadorias do Paraná, 173 members on the BM&F, 217 members on the Liffe, 150 on the CSCE, etc. On the LME, there are five categories of members: 15 ring-dealing members, who are clearing members with the right to issue client contracts and the exclusive right to trade in the pit; 25 associate broker clearing members, who can issue client

[10] In May 1997, the CBOT and Liffe established links to enable trade by open outcry at times when the original exchange's trading floor is closed. Market users are able to establish a position in Liffe-contracts at the CBOT and similarly establish a position in CBOT-contracts at Liffe.

Box 3

Merger mania

From time to time, futures exchanges pass through periods of consolidation. Most of the exchanges that existed in the United States in 1980, for example, were the result of the merger of two or more exchanges. The 1990s were a particularly busy period for mergers. Partly, this was the result of the increasingly competitive character of futures trade: electronic trading posed a threat to the existing open-outcry exchanges. Exchange managers found that, in order to develop new contracts and trading mechanisms, they needed a sound financial basis. Partly, mergers were also the result of regulatory pressure - this was the case, for example, in Japan and, particularly, China.

In Japan, several exchange mergers took place; from 17 exchanges in September 1993, the number has gone to eight in 1997. In the United Kingdom, Liffe merged with the London Commodity Exchange in September 1996 and now trades a range of soft commodity and agricultural contracts including futures and options on cocoa, robusta coffee, white sugar, grain and potatoes. In the United States, NYMEX, the world's premier energy futures exchange, merged in 1994 with Comex which operates today as its subsidiary, and members of both NYCE (created in 1870) and CSCE (founded in 1882) voted on December 1997 to merge and form the "Board of Trade of the City of New York" (NYBT). The merger is scheduled to occur before the end of June 1998.

The next series of mergers is likely to be international. Several exchanges have already formed strong overseas links.

contracts but cannot trade in the ring; 4 associate trade clearing members, who are not allowed to issue client contracts or trade in the ring but who are entitled to clear their own business; 5 associate broker members, who can issue client contracts but are not clearing members and may not trade in the ring; and, finally, 52 associate trade members, who have no trading rights except as clients.

27. Buying a seat can be expensive, costing easily between US$ 80,000 and US$ 200,000 on the large United States exchanges. For every seat bought, one is entitled to have one representative on the trading floor (memberships often give the right to have more than one representative on the floor). Larger companies often have more than one seat. The number of people actually on the floor is generally much lower than the number of seats. In assessing the breadth of participation on an exchange, it is usually better to look at the list of companies active on the floor rather than the total number of seats.

28. The membership of several exchanges has changed considerably over the last few years, as a result of two developments. Firstly, the number of members has declined because of an erosion of commission fees, which has made it less costly to trade through another broker and thus less attractive to be an exchange member oneself. Secondly, a change in the participants in the commodity trade, from specialist traders to financial intermediaries, has led to a decline in the number of trading houses that are members of exchanges, while the number of brokerage firms and banks who are members has increased. These brokerage and banking companies have clearly become very important for the commodity futures trade, not only as intermediaries for hedgers and speculators, but also for the offsetting of swap contracts. Several of the larger ones, such as J.P. Morgan, Merrill Lynch and Refco, are now represented on commodity futures exchanges worldwide.

29. Another development is taking place on the two fuel futures exchanges, the IPE and NYMEX. During much of the 1980s, these were dominated by independent oil traders and the so-called "Wall Street refiners" (investment banks such as Morgan Stanley or Goldman Sachs). The large oil companies at that time were still very much involved in long-term fixed price contracts. In recent years, the role of oil companies such as BP, Shell, Elf and Total acting as intermediaries for third parties (that is, handling the trade of developing country importers and exporters) has been increasing. This development is not entirely risk-free for exporters, who may well be considerably reducing their market power by using an oil company instead of an independent broker as a risk management intermediary.

30. The balance of participants is different from market to market. Some markets, such as the LME, the IPE and the white sugar markets of London and Paris, are heavily dominated by commercial interests, which undertake both hedging and speculative trading. Others, including most of the exchanges in the United States, Japan and China and all gold and silver markets, are dominated by non-commercial interests, many of them speculators. Within the group of speculators, the role of locals vis-à-vis that of investment funds is different from market to market, and also from one period to another.

31. There are few reliable data on market participation, and this is a major obstacle to any study on the influence of different market participants on the functioning of commodity exchanges. In the United Kingdom and France, there is no reporting on the size of market participation by different groups. In the United States, buyers and sellers of futures contracts on the commodity exchanges are divided for regulatory purposes into those who have an interest in the physical trade of the commodity concerned and those who do not. The first are called "commercial interests" or "hedgers", the second "non-commercial interests" or "speculators". While figures based on this classification are the only ones available, the terminology is misleading. While those users who have a commercial interest in the underlying commodity are often hedging their price risks, they also speculate on a fairly large scale. Those who do not have a commercial interest may be speculators or may be firms representing clients who are speculators or hedgers; or they may be market makers, arbitrating futures and options positions.

32. In terms of transaction volume, figures on participation are not easy to obtain because many positions are opened and closed on the same day. Thus, it is difficult to get a clear picture of the distribution of open interest (the remaining open positions at the end of the day) between non-commercial and commercial interests. In the United States, non-commercial interests, together with those holding non-reportable positions, generally account for a significant share of all markets.

33. Commodity exchanges all have a clearing house system: an associated clearing house automatically becomes a counterpart to all transactions on the exchange, and thus guarantees that there is no counterpart risk for those entering into transactions through the exchange. Clearing houses secure market safety by two means: by margining, and by providing financial guarantees. On the OTC market, clearing houses do not exist, and thus all participants run counterpart risks. The continuous accumulation of counterpart risks in a growing market is one of the reasons why successful OTC contracts are likely to give rise to new exchange-traded contracts.

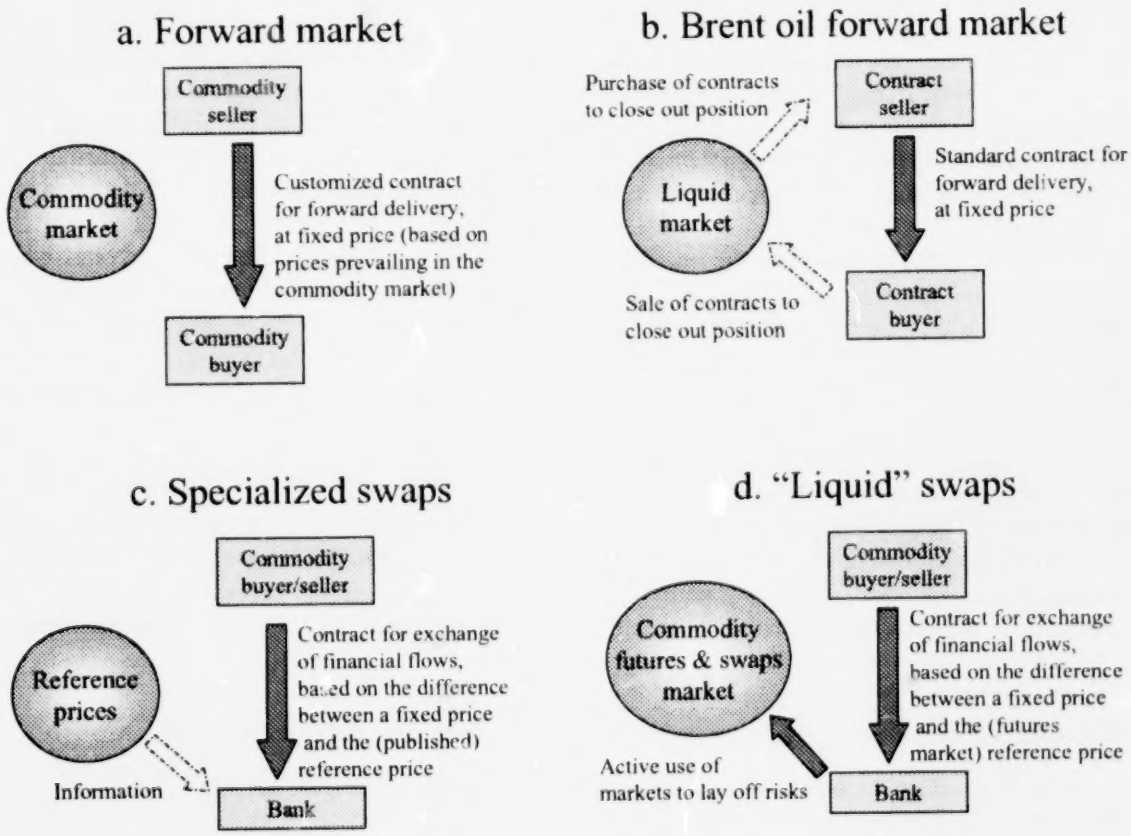
B. The OTC market

34. The medium of trade for OTC risk management instruments such as forward contracts, swaps and OTC options is the OTC market - a concept that includes many different forms of interaction an overview is given in figure 3.

35. In its origin and simplest form, the OTC market resembles the traditional forward trade in commodities: a direct interaction between two companies, in this case client and "intermediary" (with the intermediary being either a bank, a trading house or a brokerage firm). This type of system is nowadays common only for the most specialized instruments - that is, either longer-term instruments or ones designed for commodities for which no liquid futures market or even no recognized reference price exists. The traditional forward markets have grown somewhat in this direction, since now forward contracts often contain risk-management-type clauses (e.g. a fixed minimum price, with the possibility of benefiting partly from price increases).

36. For this type of specialized risk management instrument, "shopping around" for the most competitive quote is in general quite difficult, because the market is not transparent, and intermediaries refuse to give price quotes to those they do not know well. Moreover, as the instrument is tailored to the needs of the client, once one has entered into a transaction, it is difficult to reverse it. Banks and others offering these instruments can lay off some of their risks, but have to carry a part of the

Figure 3
Types of OTC markets


a. Forward market
Commodity seller
Commodity market
Customized contract for forward delivery, at fixed price (based on prices prevailing in the commodity market)
Commodity buyer
b. Brent oil forward market
Purchase of contracts to close out position
Contract seller
Liquid market
Standard contract for forward delivery, at fixed price
Sale of contracts to close out position
Contract buyer
c. Specialized swaps
Commodity buyer/seller
Reference prices
Contract for exchange of financial flows, based on the difference between a fixed price and the (published) reference price
Information
Bank
d. "Liquid" swaps
Commodity buyer/seller
Commodity futures & swaps market
Contract for exchange of financial flows, based on the difference between a fixed price and the (futures market) reference price
Active use of markets to lay off risks
Bank

transaction risks on their books (including risks related to the highly sophisticated models and procedures that are necessary for their own risk management; both models and procedures have been found wanting in some cases, leading to large losses).

37. A somewhat more advanced form of OTC market can develop when instruments become more standardized. A parallel development can be seen in the forward market, where the Brent oil forward market has developed to such extent that it now resembles in many ways a futures market[11] - even to the extent that squeezes similar to those on futures exchanges are tried from time to time. Companies often sell cargoes for forward delivery to other companies at the market price of the moment and buy fungible cargoes (that is, cargoes with the same specifications) back later. The purpose of these "paper" transactions is to manage price risks, as in the case of futures. For example, a company which wishes to cover itself against the risk of a price decline for a quantity of Brent oil it has in its pipeline can sell one or more cargoes on the forward market and buy back these cargoes when the physical transaction has taken place. If prices have declined, the company will have made a profit on the paper transaction which will offset at least partially its losses on the physical transaction. Thus a risk management market has come into being.[12] As all these transactions take place by phone, with confirmation by fax/telex, participants must know eachother. The participants are large oil firms (producers, traders or refineries) and investment banks. The Brent oil forward market is difficult to use for outside speculators because of its transaction size: the normal contract is for 600,000 barrels (compared to 1,000 barrels on the futures exchange), with a value of over US$ 10 million.

38. The swaps markets are generally quite well developed. One can see a clear standardization of swaps (the documents used, for example, are mostly based on standard documentation of the International Swaps and Derivatives Association's (ISDA)). There is also more and more secondary trade in swaps, with prices already being publicly quoted for longer-term fuel swaps and to some extent for metal swaps. Banks and other financial entities offering risk management instruments lay off virtually all the risks through other OTC transactions and futures market trade (and, in some cases, also through physical trade transactions). Brokers have started playing an active role in these swaps: a brokerage collects the quotes of a number of banks, trading houses, and so on, and is thus able to offer the most competitive quote to potential clients, sometimes by way of an electronic information service such as Reuters. The brokerage then assists in putting the deal together.

39. For all OTC instruments, the market is "made" by intermediaries. They are the ones who decide which instruments will be available and at what price. The intermediaries can be divided into real intermediaries, who take virtually no risks, and "financial engineers" who manage a portfolio of risks using a wide array of instruments and usually take on some residual risks themselves. In the first group there are a number of brokerages and banks; the second includes trading houses and a limited number of large investment banks.

40. One essential characteristic of the banks, trading houses and brokerages offering OTC instruments is that they are risk-averse. They try to limit or even eliminate the risks they take when offering risk-management instruments by offsetting transactions either OTC, on a futures exchange or through physical trade. As the possibility of offsetting swaps and similar mechanisms by physical transactions improves an intermediary's capacity to offer different instruments, it has become attractive

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[11] Similar markets exist for several fuel products, namely naphtha, heating oil, gas oil and heavy fuel oil.

[12] See also P. Lemanski, *Le négoce international du pétrole*, Les Cahiers de Recherche du CREMMAP, Numéro 15, juin 1988.

for investment banks to become involved in physical trade. This is partly why Salomons took over Phibro, Goldman Sachs took over J. Aron, and several banks such as Crédit Lyonnais, Barclays and J.P. Morgan set up their own commodity-trading subsidiaries.

41. Another essential aspect is that all those putting together OTC risk management deals make profits on their margins. When competition increases, margins decrease. These intermediaries thus have an interest in keeping instruments highly tailored to avoid standardization, an interest that is contrary to that of many of those using the instruments. The forces of supply and demand for OTC risk management instruments thus work in opposite directions, with the likely result that there will be a continuous expansion in the types of instruments offered by the intermediaries. The offer of constantly more complicated instruments limited only by the ability to develop software programmes which can manage the consequent risk exposures will be used to counterbalance the similarly incessant standardization of simpler instruments.

Chapter II

COMMODITY PRICE RISK MANAGEMENT INSTRUMENTS

A. Forward contracts

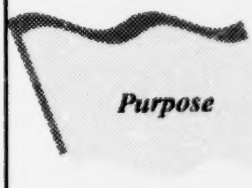
42. Forward contracts (see box 4) are agreements to purchase or sell a specified amount of a commodity on a fixed future date at a predetermined price. Physical delivery is expected and actual payment occurs at maturity (the future date that has been agreed to in the contract). If the actual price at maturity (the spot price) is higher than the price in the forward contract, the buyer makes a profit, and the seller suffers a corresponding loss. If, on the other hand, the spot price is lower, then it is the buyer who loses and the seller who profits. A major advantage of forward contracts is that the establishment of a predetermined price eliminates the risk of price changes for both the buyer and the seller.

43. Forward contracts are relatively old risk management instruments, but their origins are not clear. Presently, most forward trade is OTC, with transactions being made directly or through brokers and dealers by telephone, telex and fax. While many OTC forward markets for commodities are not very liquid (that is, they register low trading levels), a few, such as the Brent forward market for crude oil and those for several fuel products, are liquid. Forward markets for major currencies are also liquid, and there is keen competition among institutions over forward quotations for transactions with maturity of up to one year.

44. There are currently several organized forward markets, mainly in economies in transition and in China. The LME was originally a forward market and retained many features of such a market until the Financial Services Act of 1986. Among these features was the continued reliance upon principal-

Box 4

Forward contracts



Purpose

- facilitate planning and marketing
- lock in forward prices
- secure a processing margin

Advantages

- tailor-made for the needs of the contracting parties
- ensures physical market for the commodities produced (or, for a buyer, delivery of the commodities needed)
- can often make production or pre-export finance possible

Disadvantages

- difficult to revert the initial decision
- major counterparty risk
- possibility of profiting from favourable spot market developments is lost
- pricing is not transparent

to-principal contracts between members of the exchange. Nevertheless, the LME had essentially shifted from forward to futures trading over a century earlier, insofar as only a very small percentage of contracts were expected to result in physical deliveries on the exchange.

45. Forward contracts are mostly used to hedge the risk of holding a certain commodity or of having the obligation to deliver it (or the need to acquire it) at a future date. This is called "forward cover" and involves the execution of a set of offsetting transactions simultaneously in the spot and the forward markets. For example, if a trader holds (or purchases in the spot market) a certain commodity, he can insure against adverse price movements by selling the same amount of that commodity in the forward market at the prevailing forward price. In this case, he would be holding a "short position" in the forward market (when a person buys forward or futures contracts, that person is said to have gone "long" or to be holding a "long position"). When the forward contract matures, the trader sells the commodity at the specified price, thereby avoiding the risk of a price decline in the intervening period. This enables him to fix the amount of revenue from the future sale of the commodity at the time that the forward contract is signed, therefore locking in the price, and, of course, his profit margin.

46. There are two important features of the forward contract. First, no cash transfer occurs when the contract is signed. The seller of the commodity is obliged to deliver the commodity at maturity, but the buyer pays no money upfront (except for transaction fees). Second, since the sole guarantee that a forward contract will be honoured is the reputation of the two parties entering the agreement, there is an inherent credit or default risk: the counterpart of the forward transaction may fail either to deliver the commodity or to pay the agreed price at maturity.

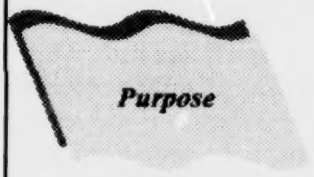
47. Forward contracts are widely used for all commodities and in all regions. For instance, a large part of the world's cotton is traded through three- to twelve-month forward contracts. Ghana sells a large part of its cocoa forward, and, as a result of a World Bank programme, two-thirds of Côte d'Ivoire's cocoa crop was to be sold forward from 1992 onwards. Colombia sells most of its coffee through one-year forward contracts with roasters. Rubber-exporters from countries such as Malaysia and Indonesia now sell principally through forward contracts.

B. Futures contracts

48. Futures contracts (see box 5), like forward contracts, are agreements to purchase or sell a given quantity of a commodity at a predetermined price, with settlement expected to take place at a future date. However, certain specific characteristics of the futures contract put in in a category of its own (see box 6). For example, unlike forward contracts, a futures contract does not necessarily imply physical delivery in fulfilment of the agreement. In other words, although the contract can be used to make or to take physical delivery, the usual outcome is the offsetting of the contract on or before maturity (the closing date of the contract) by an equivalent reverse transaction. On organized commodity exchanges, where most futures contracts are traded, this involves the buying at different times of two identical contracts for the purchase and the sale of the commodity in question, with each cancelling the other out. This is called "closing out" the position, and it is possible because all transactions are guaranteed through a central body, the clearing house, which automatically assumes the position of counterpart to both sides of the transaction. Thus, a producer who wishes to hedge has an obligation towards the clearing house, not towards a consumer or speculator. Likewise, consumers obtain a position vis-à-vis the clearing house.

Box 5

Futures contracts



- hedge price risk
- lock in the value of inventories or finance part of storage costs
- secure a processing margin

Advantages

- no need to negotiate contract specifications
- minimal counterparty risk
- initial position can easily be reversed
- delivery is not necessarily implied

Disadvantages

- working capital is frozen up in margins
- possibility of profiting from favourable spot market developments is lost
- prices of the hedged product and the futures contract may diverge

Box 6

Forward contracts vs. futures contracts

What do they have in common?

Both of them are agreements to purchase or sell a specific commodity at a specified future date and at a pre-set price; i.e. performance occurs at a subsequent date.

What makes futures special?

1. Futures trade on organized exchanges through clearing houses. Most forward contracts are traded OTC (but some, mainly for metals, coffee and rubber, are traded in forward exchanges).
2. Futures have standardized contract terms (amounts, grades and delivery terms). Forward contracts can be tailor-made to match specific hedging needs.
3. Futures require initial cash transfer for margin payments and may require daily settlements (i.e. they are marked-to-market) to adjust margins to adverse price movements. Forward contracts require cash transfer only at maturity.
4. Futures imply very little counterparty risk because the clearinghouse guarantees the fulfilment of the contractual obligations. Forward contracts may involve a high degree of counterparty risk because no similar clearing-house facility exists.
5. Only a very small fraction of futures transactions result in actual delivery of the underlying commodity; physical delivery is possible but not expected. Forward contracts contain the expectation of physical delivery.

49. Like forward contracts, futures contracts more or less lock in the price the hedger is going to receive or to pay, but this time the mechanism is indirect. To hedge, a producer planning a future physical sale would, at the time of planning, sell a futures contract (this is called "price fixing"). When, later, he actually sells his physical goods, he has to simultaneously buy a futures contract, to close out his position. For the physical sale, he receives the market price prevailing on the day of the sale. If this price is lower than the price in the futures contract, the loss on the physical market is compensated by the higher price on the futures contract. This happens because the futures contract that he had sold earlier should have declined in value (in harmony with the physical market) enabling him to buy (repurchase) the contract at the lower price. On the other hand, if the price in the physical market is higher than in the futures contract, the gain on the physical market is offset by the loss on the repurchase of the futures contract (see box 7 for an example).

50. Because of its indirect mechanism, hedging does not guarantee that the profit or loss on the futures contracts will fully offset the loss or profit on the physical transaction. This is the so-called "basis risk": the risk that users of futures markets run because the specific physical commodity they wish to hedge does not have the same price development as that of the standardized futures contract. This may happen for a variety of reasons: the markets to which a company exports are not necessarily the same as those where futures markets are located; price developments on the customer market can be different from those on the futures exchange; the product specified in the futures contract may not be the same as the product exported, and may have a different price development; and, moreover, the relation between futures prices and spot market prices can be temporarily disturbed, for example by attempts to manipulate the market or by technical squeezes caused by a shortage of supply. Also, when the futures contracts are denominated in a currency other than the one used in the physical

Box 7

Example of commodity price hedging

Assume a commodity producer knows in January that he will sell 150,000 lbs of arabica coffee in 6 months' time. The price in January for a September futures contract (a contract that reaches its maturity, that is, stops trading in September) is 86 cts/lb, a price that is sufficiently satisfying to the producer. Thus he can more or less lock in this price by selling four "Coffee C" September futures contracts (of 37,500 lb each) on the New York Coffee, Sugar and Cocoa Exchange. The price for the futures contract is the price for a standard quality, and the producer knows that for his coffee he normally gets this price.

Imagine that six months later, in July, prices have fallen. The producer sells his coffee on the spot market in New York for 71 cts/lb. The price of the September contract has declined also, to 71 cts/lb. This means that the producer is able to buy four September contracts for 71 cts/lb, and use these to offset the four contracts he had sold, for which he had received 86 cts/lb. He thus makes a profit of 15 cts/lb on the futures market. The effective price he receives for his coffee is therefore 86 cts/lb: with his sale of four futures contracts in January he effectively "fixed" the price of his coffee six months before the physical sale took place.

Had the producer been unable to find a client in New York, he could have delivered his coffee to an exchange-approved warehouse in New York, and thus offset his sale of four futures contracts through physical delivery; again, the effective price he would have received for his coffee would have been 86 cts/lb. This is only attractive if the coffee the producer has for sale does not command a premium on the physical market. But even if the producer knows that for his coffee he normally receives a premium in comparison to the standard quality, the commodity exchange can be used to fix his sales price, as long as the price for his coffee on the spot market and that of the futures contract move in tandem.

transaction, exchange rate risks can result (which in some cases can be offset on the financial futures markets).

51. When a producer, trader, processor or consumer decides to hedge his risks by buying or selling a futures contract, he has to reckon with margin payments. There are "initial margins", the deposits that have to be paid for the sale or purchase of every contract, and "margin calls", deposits that have to be paid later if the price of the contract moves in a way adverse to the customer. These payments act as guarantees for the fulfilment of contract obligations. On organized futures exchanges, the size of margin payments is determined by the exchanges (although brokers and other intermediaries generally provide credit lines to their clients to pay margin calls up to a certain level). On the OTC market, the size of margin payments is determined in direct negotiation between the two parties involved, and margin payments are generally not made on a daily basis.

52. Futures contracts are available for all major currencies, major interest rates and a number of mineral and agricultural commodities. The table in annex III provides an overview of the commodity futures contracts traded on exchanges. There is also an active OTC trade in futures, in a few centers, for certain commodities which do not have exchange-traded contracts. In some cases, an OTC futures market has developed in response to regional time differences which make the use of an organized exchange impractical. Risk management instruments offered for some metals, such as cobalt, and the short-term fuel swaps market could well be considered OTC markets. It should be pointed out that OTC futures are illegal in the United States.

53. Companies from developed countries still account for the bulk of commodity exchange futures activity, be it speculative or for hedging purposes. The use made by developing countries and Eastern European countries of the exchanges, directly or through intermediaries, is rather limited, but seems to be growing. A very small number of companies from developing countries and other institutions are members of exchanges in developed countries. Zambia Consolidated Copper Mines (ZCCM), Chile Copper Ltd (Codelco) and Gecamines (Democratic Republic of the Congo) are Associate Trade Members of the LME; the Banco Nacional de Mexico, active in silver trade, is a member of the Comex division of NYMEX. The Chinese State-owned company CIFCO, one of China's largest brokerage houses, has become member of several American exchanges in the 1990s. In most cases, brokers, banks and other intermediaries are used to undertake activities on the futures markets. Some companies have their representatives close to the exchanges to arrange their risk management business, albeit by way of brokers. For example, Brazil's and Mexico's oil companies, Ghana's Cocoa Marketing Board, and Cuba's sugar export organization have offices in London or New York which are responsible for futures and options transactions. This allows those entities to follow quite advanced risk management strategies.

54. However, most users from developing countries are far away from the exchanges and rely heavily on intermediaries. In most cases, these intermediaries are trading houses. The direct use of exchanges through brokers is limited. For soft commodities, Latin American and Caribbean producers are among the major users from developing countries users, hedging, through brokerage houses, about a quarter of the cocoa, coffee and sugar exports from that region on the CSCE in New York. Latin American exporters of cereals and soybeans similarly hedge on the United States exchanges. In metals, Latin American exporters are the most active direct users of the futures exchanges. The region's copper producers and manufacturers of semi-finished copper products (the major public and private copper exporters of Chile, Peru, Mexico and Brazil) have regularly used the LME and Comex. Outside Latin America, the main developing country using the commodity exchanges is China, which, through a number of brokers, is very active on the cereals, sugar, metals and fuels markets. African

producers such as the Democratic Republic of the Congo, Zambia (both for copper) and Zimbabwe (for nickel) also use the exchanges.

55. On the fuels markets, the Mexican Ministry of Finance has been a major participant in the oil futures and options markets since November 1990, with the aim of protecting budget revenues. It has sold crude oil futures and call options through a number of trading houses, and has bought put options on NYMEX, with the deals spread out over a number of months to take into account the large volumes involved. Net profits have been high, but the Government did have to put up deposits of some US$ 200 million, an amount beyond the reach of many other developing countries. Brazil's Ministry of Finance also locked in fuel prices for a period, though the quantities involved were smaller. Other Governments active in the same way include those of Chile, Ecuador and Honduras. Several States and other government bodies in the United States, dependent on revenues from oil sales or large oil buyers, have also started to manage their price risks on futures and options markets.

56. In some cases, futures markets can be used as a market of last resort for physical delivery, especially by non-integrated mineral producers. The LME aluminium contract was used as such, especially by the former Soviet Union; in the early 1980s, Cuba used the LME nickel contract to deliver most of its nickel. It can also be an attractive delivery location if the discounts it imposes on on lower grades are less than discounts paid in the physical market; for example, much of the cocoa produced in Papua New Guinea is delivered against the London and New York futures contracts.

1. *Liquidity*

57. Liquidity, that is a high volume of transactions and a large number of participants, is an essential condition for the proper functioning of organized futures exchanges. If the trade in a futures contract for a certain contract month (for instance, a March cocoa contract) is liquid, those wishing to buy or sell can trade easily at little cost - that is, the difference between the price paid for a contract and the price that would be received for selling it (the bid-ask spread) is minimal. If the trade in such a futures contract is not liquid, manipulation of prices is easier, transaction costs will include a high bid-ask spread and, because of the limited competition, prices offered may not reflect economic realities. Markets that are liquid, or "deep", can easily absorb large offers without prices being unduly affected; in a market that is not "deep", large-scale hedgers have to space their transactions carefully to prevent unnecessary losses. A market that is liquid can be used easily for hedging purposes; a non-liquid market should only be used when one has a very good knowledge of the market, when one can follow its development on a regular basis and when one knows how to devise a strategy that takes the lack of liquidity into account.

58. Another advantage of a high degree of liquidity is that speculators do not make systematic profits at the cost of hedgers. Futures markets are sometimes compared with insurance markets: hedgers pay a risk premium (comparable to an insurance premium) to speculators in order to cover their risks. If this comparison was correct, it would mean that hedgers were following a sub-optimal strategy, and would systematically lose out to speculators in the long run. However, it seems that on liquid markets, because of the large degree of competition for buying and selling contracts, there is no real risk premium in the long term. The costs involved are those directly connected to concluding and executing the financial transaction.

59. Lack of liquidity is more a problem for commodity futures contracts than for currency or interest rate futures contracts. Many commodity futures contracts are not very liquid, especially when

their term is beyond six months.[13] This situation may make it necessary to adapt hedging strategies, for example, instead of buying a contract for 18 months forward, one buys one for six months, selling it at the end and buying a new contract to cover a further six months, and repeating the operation at the end of this period. This is called the "rolling-over" of the contract (see box 8), and is a strategy that can be used to obtain synthetic long-term hedges, similar to swaps. The choice of the commodity exchange to be used should also depend on the degree of liquidity. For example, Thai sugar exporters prefer to take the New York international raw sugar market as the reference price for their white sugar exports, instead of using the white sugar markets in London or Paris which have lower turnover and are dominated by a small number of trading houses.

60. Linked to the question of the liquidity of organized futures markets is the question of speculation. Often speculation is seen as profiting on the back of producers and consumers, or manipulating prices to make profits. However, on organized futures exchanges, manipulation is more often tried by large consumers, traders or producers than by non-commercial speculators. Also, as discussed above, on liquid markets speculators do not make systematic long-term profits at the cost of hedgers. In fact, speculation by a large variety of participants with differing views of market developments and price expectations may increase liquidity and actually reduce the likelihood of market manipulation, thus making the market more attractive to hedgers. However, when there is large-scale participation by institutional speculators, hedging becomes more complicated. Short-term price movements generally become more pronounced, as these institutions, using the same types of technical analysis and computer programmes, tend to go in or get out of markets simultaneously and tend to trade in the same direction. These movements can have serious short-term effects for the representativeness of the prices of contracts in terms of their relationship to market fundamentals.

2. *Indirect use of futures contracts in physical trade*

61. Futures contracts have many indirect uses. For example, sometimes they are used to facilitate direct physical trade through mechanisms such as the exchange of futures for physicals or against actuals (see box 9). Another very important indirect use of futures contracts is to provide reference prices for contracts or decisions involving the delivery, acquisition or production of a commodity at a given time in the future. This important social function of futures contracts is called "price discovery", and can be defined as the revealing of information about future cash market prices through the futures markets.[14] In other words, futures prices provide good estimates of what the prices of the underlying commodity will be on certain future dates, which is critical to a variety of users.

62. Physical sales contracts often contain clauses guaranteeing floor prices, price increase sharing agreements, and other similar features which, in effect, amount to combinations of futures and options.[15] The prices in these types of contracts are expressed as a function of specified future price quotations, or reference prices, which means that the final price at which the commodity will eventually change hands is not known at the moment of the signing of the contract. This use of reference prices is usually based on prices of futures contracts when they exist. This technique often makes it easier to come to a sales or purchase agreement, as one has effectively separated the price and volume

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[13] See G. Kaminsky and M. S. Kumar, *Time Varying Risk Premia in Futures Markets*, International Monetary Fund Working Paper WP/90/116, December 1990.

[14] See R. Kolb, *Understanding Futures Markets* (3rd edition), New York, New York Institute of Finance, 1991.

[15] See J.P. Morgan & Co. Inc. (eds), *Commodity Linked Finance*, London, Euromoney Books, 1992, in particular chapter 2.

Box 8

Rolling-over contracts in a situation of contango or backwardation in commodity futures markets

In a perfect market, the prices of further-out futures contracts are higher than the prices of nearby contracts, to reflect interest and storage costs; if this is the case, the market is said to be in *contango*. In the commodity markets, many futures contracts show the opposite pattern: nearby prices are higher than further-out ones. This is called *backwardation*. Backwardation can be attributed to the convenience yield, the value of having a commodity at one's disposal. Often, the value of having a commodity at one's disposal is the effect of a poorly functioning market. Many markets are squeezed quite regularly, creating a shortage of supply for nearby delivery. This could be due to technical reasons (such as temporary supply disruptions, or as a result of exchange regulation, as in the case of the New York raw sugar market, where sugar from Cuba, the world's largest raw sugar exporter, is not deliverable), or to games played by some of the bigger market participants.

Futures contracts for crude oil, non-precious metals, livestock and raw sugar are most of the time in backwardation, others, such as cotton and grain contracts, show backwardation from time to time. Only a limited number of contracts - principally gold, silver, soybeans, arabica coffee and cocoa - tended to be systematically show a contango until two or three years ago; now, even these markets show a backwardation occasionally. Whether a market is likely to be in backwardation or contango has major implications for those wishing to hedge further-out positions, and to some extent for commodity processors.

To understand this, consider the way longer-term hedging operates. To obtain a three-year hedge on copper, to cover the price risks of selling 250 tons/month, a company would have to sell 360 futures contracts (of 25 tons each) on the LME. Ideally, the contract months sold should correspond as closely as possible to the timing of physical transactions. In practice, however, the copper contract loses liquidity after one year out. It is thus likely that the company would have to roll over its contracts and cover its sales of the second and third year by selling 240 contracts for one year away, repurchasing these close to the time of maturity, and at that moment selling again 240 contracts for up to one year further away; at the end of the second year, it rolls over another time (in this case 120 contracts).

Consider a market which is neither in contango nor backwardation, that is, the price of all futures contracts is the same. In this case, the company would have to pay the same price for its nearby contracts as it receives from selling the contracts which are one year out; rolling-over is free of cost (abstracting from commission costs). If the market is in contango, the company would have a profit: further-out futures prices are higher than nearby ones, and the company would thus receive more from selling one-year out contracts than it pays for nearby contracts (note that this profit is independent of the actual movement of prices). In this way, a number of sugar trading houses had very large roll-over profits on covering a long-term contract with the Philippines in the early 1980s (when the sugar market was still in contango). Exporters of commodities such as cocoa and coffee could, at least in theory, also profit from the contango which reigns in their markets by selling far forward and then rolling over their contracts.

Now, consider the case of a market in backwardation. A company would then pay a higher price for the nearby contracts it buys than it receives for the further-out contracts it sells. It thus makes a loss every time it rolls over its contracts. What is worse, this loss is, in theory, unlimited, because it depends on the scarcity of the commodity on the spot market. In practice, regulatory authorities normally impose a backwardation limit, but this can still be very high. Markets which are in backwardation are thus difficult markets for hedging longer-term price exposure, at least for sellers of the commodities concerned. For buyers of futures contracts (consumers or users), backwardation offers additional profit opportunities, while maximum losses are limited by the maximum size of the contango.

In practice, producers of commodities such as crude oil, metals and sugar can still hedge their longer-term price exposure if they have relatively advanced skills in trading on futures markets. The viability of the long-term hedge will hinge on the ability to roll contracts forward every time that the backwardation disappears or becomes relatively small. This is another reason why over-the-counter instruments may play a large role in hedging longer-term price risks in these commodities: an intermediary's offer of a hedge to a producer can then be matched by a hedge with a consumer, and backwardation risks are virtually eliminated.

Box 9

How an executable order works

Imagine the following price development for sugar:

Date:		22/12	31/1	28/2	28/3	30/4	31/5
Price (cts/lb):	8.6	8.7	9.1	8.9	8.7	9.25	

The seller's marketing director is under instructions to sell a certain volume of sugar in December for delivery in July, but to realize a higher price than that prevailing in December (8.6 cts). He can attain this objective by going into an executable order in December based on the July futures contract with the right to fix the price some time between January and June. He sees that in February the price of this contract has gone up to 9.1 cents. At that date, he phones the buyer to advise him of his decision to fix the price at that level. Therefore he sells his sugar for 9.1 cts/lb. To avoid his price risks, the buyer had bought July futures contracts on the day of signing the contract, 22 December, for a price of 8.6 cts/lb. At the date that the seller decides to fix his price (February), the buyer can sell these futures contracts. He receives 9.1 cts/lb per contract and realizes a profit of 0.5 cts/lb on each futures contract. This fully compensates him for the higher price that he has to pay for the physical sugar.

In practice, the fixing of prices does not take place on a single day, but on a number of days during the period between the signing of the contract and shipment, each time for a fraction of the contract volume.

component - one agrees on the volume and the price formula, but not on the actual price. Different pricing formulas can be used, the main ones being spot prices with profit- or loss-sharing, average pricing, price calls and executable orders. Price calls and executable orders are mainly used for trade in agricultural products, whereas a system of average prices is generally preferred on the fuels and the metal markets; profit- or loss-sharing clauses are used in both the agricultural and the metal markets.

63. In contracts based on spot prices with profit- or loss-sharing, the reference price is set at a predetermined level. The buyer and the seller then share in the profit or loss resulting from the difference between the actual market price and that predetermined price level. A variation of such a contract is a spot price contract with a price guarantee clause: for example, an exporter can guarantee its client that if the world market price falls below the price at which a forward contract was signed, the client will pay the lower world market price.

64. In the case of average pricing, the price which is finally paid is the average level of a reference price (or several reference prices) during a specific period, usually one month (often the month before shipment). This pricing system is very common in the case of metals traded on commodity exchanges, using futures prices as reference prices. Copper was the first metal for which commodity exchange prices replaced prices set by transnational companies. In 1966, Zambia, followed by Chile and most other copper-producing developing countries, announced that instead of selling for fixed prices they would base their contract price on the monthly average of the nearest contract month of the LME copper contract. The pricing of other exchange-traded metals followed the same pattern during the 1970s and, in the case of aluminium, during the 1980s. Export prices for these metals are now in general the average of LME prices in the month before shipment, plus a fixed premium or minus a discount. This system is also common in fuel exports. Several variations are possible, such as giving the buyer a choice of reference price periods, at the moment of the final determination of the price.

65. In price calls, the seller (or buyer) has the right to choose for a certain tonnage (for instance, a fixed part of the total contract, or a variable part, say, up to 25 per cent) the settlement price of the previous day's exchange trading of a specified futures contract. He advises his counterpart of his decision before the market opens, to give him the opportunity to hedge. This system is used in several agricultural markets, including the sugar market.

66. In executable orders, the price is determined as a function of a published price, generally a price on one of the futures exchanges. For example, a sales contract for a certain volume of raw sugar is signed in December for delivery in June, with a price clause establishing that the price will be 0.5 cts/lb below the raw sugar price of the July futures contract on the New York CSCE at a specific, still to be determined date. Either the buyer or the seller (usually, the seller) may fix the price at which the contract will be executed at any time before the end of June.

67. Executable orders offer considerable flexibility to both buyers and sellers and, for this reason, they are one of today's most commonly used pricing formulas for exchange-traded agricultural commodities. For sellers, executable orders are attractive when they expect prices to increase, because it gives them a sales contract without having to lock in prices; in most countries, a sales contract is necessary to obtain access to government pre-export finance. Executable orders were initially used mainly in contracts between traders and consumer companies. Their use by producers began only in the 1970s, for sugar, and in the late 1980s for cocoa and coffee. Executable orders are now widely used by developing country exporters of wheat and soybeans. It is, after average pricing, the main pricing system used in the trade in copper trade. Companies from developing countries often prefer this type of contract to the direct use of futures markets because it allows them to avoid paying margin calls.

68. With contracts such as executable orders, trading houses can offset the risks in their books (that is, use sales contracts to balance purchasing contracts) and either take the remaining risks on themselves or cover them on a futures exchange. Trading houses used to keep large speculative positions, but in the late 1980s and early 1990s this led to some very large losses, which led to the disappearance of several large trading houses. Banks now require trading houses to lay off most of their risks on futures exchanges.[16]

69. For the above reasons, the reliability of the prices of futures contracts on commodity exchanges as predictors of physical prices is of key importance for the sale of physical commodities. If the reference price cannot be regarded as reliable, price determination becomes a major problem. Such a situation, which may be the result of low participation of the producers, traders and consumers of a commodity in futures trade, has arisen in the rubber market, where pricing used to be based on futures quotations. Due to a large increase in longer-term forward contracts between producers and consumers, the spot market for rubber is virtually disappearing, and turnover on futures markets has plunged. The pricing of forward rubber contracts has thus become increasingly difficult.

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[16] See, for instance, D. Blackwell, "Banks pull out of commodities", *Financial Times*, 20 November 1992, and N. Behrmann, "Squeeze on bank financing forces many firms to abandon the commodity trading business", *Wall Street Journal*, 28 December 1992.

C. Options

70. Options (see box 10) are risk management instruments that do not lock in prices, but protect those who buy them against unfavourable price movements while retaining the possibility of profiting from favourable ones. An option contract is the right (but not the obligation) to purchase or sell a certain commodity at a pre-arranged price (the "strike price") on or before a specified date. For this contract, the buyer or seller of the option has to pay a price to his counterpart at the time of contracting, which is called the "premium"; if the option is not used, the premium is the maximum cost involved. If an option gives the right to buy at a pre-set price, it is termed a "call option" (see box 11). This right to buy at a pre-set price is attractive for those who think that the market price will increase: it will enable them to buy at the lower price. It gives price protection to consumers and to processors and traders for the cost of the commodities they purchase. If an option gives the right to sell at a pre-set price, it is a "put option". This protects the seller against a price decline. Options can give the right to buy or sell a certain amount of a physical commodity, or, more commonly, they can give the right to buy or sell a futures contract. This sounds like an unnecessary complication, but in effect it avoids the complicated delivery problems that characterize options on physicals. The date on (or before) which the buyer can chose to buy or sell the commodity or the futures contract is called the "maturity" or "expiration" of the option contract. For exchange-traded options, the date is usually similar to the maturity date of the underlying futures contracts, while on the OTC market, a wide variety of maturities going up to five years can be found.

Box 10

Option contracts

Purpose

- obtain protection against unfavourable price movements while retaining the possibility of benefiting from favourable ones
- valorize inventories

Advantages

- available in standardized form on exchanges, and tailor-made over-the-counter
- no "funding risk": the costs of protection are known up-front
- possibility of benefiting from favourable price movements

Disadvantages

- up-front premiums can be expensive, especially in times of volatile prices
- selling options can be highly risky
- option sellers need to pay margin calls

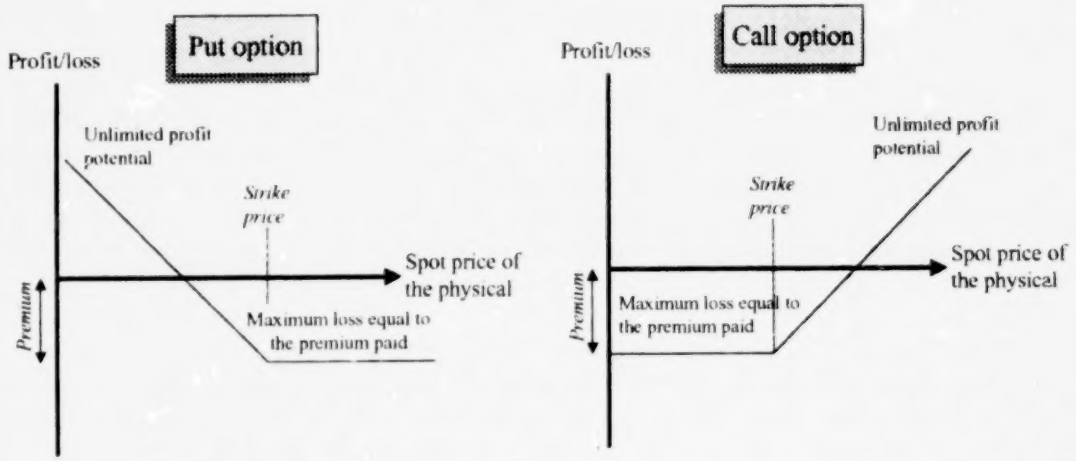
Box 11

An example of hedging with options

A trader who wants to protect himself against an increase in the price of crude oil can buy a call option. This option will give him the right to buy crude oil at a specific price (the strike price) thus enabling him to benefit if markets prices move above the strike price. The maximum loss that the trader can encounter is the premium he has paid.

A producer who wants to protect himself against a decrease in the prices of crude oil will buy a put option. This will give him the right to sell the crude oil at the strike price. If prices decrease below the strike price, the producer will exercise his right and will sell oil at the strike price.

Four factors determine the price of an option: price of the underlying commodity; strike price of the option; time remaining until expiry; and market volatility.



71. Options can perform almost the same hedging functions as futures or forward contracts (see box 12). But compared to forward contracts and futures, apart from setting floor and ceiling prices, options have two interesting characteristics:

(a) The buyer of an option has to pay the premium at the time of purchasing the option. This often requires a significant amount of cash at the outset. However, there is no risk of unexpected margin calls, which, in the case of futures, can result in the cancelling of the contract if the hedger cannot raise the necessary cash within the specified period (normally one to three days). This has been an important reason for the increased use of options;

(b) Unless the operation is executed via an exchange, the buyer of an option faces a credit or default risk by the counterpart; the seller of an option does not. The seller has already encashed his premium; the buyer, when he wants to execute his option, is dependent on the seller's meeting his commitment.

Box 12

Options vs. Futures

What do they have in common?

Both futures and options provide protection against the risk of unfavourable prive movements. With these tools, users may protect the value of inventories and improve marketing policies.

What makes options special?

1. Contrary to futures, options do not lock into a specific price, but leave open the possibility of profiting from favourable price movements.
2. Purchase of options cause less cash-flow problems because there is no risk of unexpected margin calls.
3. Options may offer a better hedging vehicle than futures in the case of uncertain supply.
4. Options are also available in over-the-counter markets.

72. Moreover, in cases where supply is uncertain (for example, in the case of an oil company unsure of the quantity it will be able to ship), options are particularly attractive compared to futures. They are often used to protect prices in deals with partners who are not totally reliable. If a fixed-price deal with a seller has been concluded, and this position is covered with a futures contract, one may get stuck with a loss-making uncovered futures contract if the physical leg of the transaction disappears. When options are used, traders' losses are limited to the up-front premium they have paid.

73. The introduction of options on exchanges is a fairly recent development, which followed the quick expansion in the OTC option market during the 1970s. The first exchange-traded commodity option contracts were introduced for sugar in 1982 on the New York CSCE. Since then, they have grown rapidly in importance, accounting now for a major part of the business conducted on exchanges. Commodity-exchange option trade is now active for a number of commodities, mainly for short maturities,[17] with the number of transactions beyond one year is still very small. Options on futures are traded actively for oil, gold, silver, coffee, cocoa, sugar, soybeans, cotton, aluminium and copper. An active OTC trade in options of up to three years is also developing.[18]

74. Most of the option volume on agricultural commodity exchanges and in the trade in gold and silver is the result of speculative activity, largely by institutional investors. Trading houses are also active, mainly in laying off the option risks they have taken in their physical contracts. For base metals, most option trade is carried out by commercial interests (basically North-American, European and Japanese producers), not necessarily for hedging purposes (see Box 13). On the exchanges for fuels, most option activity is also from commercial interests, be they producers, trading houses or consumers. Some developing countries are active on the fuel option markets, basically to protect themselves

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[17] Extremely liquid markets exist for options on currency forwards and currency futures. Recently banks have developed OTC options moving out five years and in some cases up to ten years into the future. See D. Shirreff, "Swaps: where others fear to tread", *Risk*, Vol. 2, No. 8, September 1989. Interest rates also have very liquid option markets.

[18] See N. Wilson, "New hedges for metals", *Futures and Options World*, December 1991; S.V. Gold, "Cutting the risks of hedging", *Metal Bulletin Monthly*, March 1991. In the metals market, some traders are now prepared to provide a minimum price guarantee in the form of the sale of a put option to the producer for periods of up to five years (J. Ainsworth, "Financing mining projects in the 1990s", *Metal Bulletin Monthly*, September 1991).

Box 13

The changing face of option contracts

Traditionally, there are two types of options: European options, for which settlement payments are made only if the index price exceeds the strike price at maturity (that is, the option can only be exercised on the expiration date); and American options, for which the settlement payment is based on a specific time chosen by the buyer (that is, the buyer decides when to exercise the option). The use of these options is not restricted to the regions they are named after. However, neither of these structures of settlement payments is well suited for hedging an ongoing risk such as the regular export of a commodity, or for hedging contracts such as those common in the metal industry, in which prices are defined as the monthly average of daily LME prices. Moreover, they can be very expensive, especially in the case of American options. They are, as a result, mostly attractive to speculators.

Other types of options have flourished on the over-the-counter market. To tap the largely unexploited market of producers and consumers, a private bank, Bankers Trust, recently developed a new type of option, called the Asian or average price option. A settlement payment is made if the average of the index price over the life of the option exceeds the strike price. This conforms to the hedging of a regular flow of products, and is not very suitable for speculation. The costs are much lower than those of the traditional types of options: for example, a three-year European put option for oil, at a strike price of US$ 20/barrel, in early 1990 cost $ 2.5 per barrel; a three-year Asian put option would have cost only $ 1.5 per barrel. A March-December 1991 conventional put option for copper, at a strike of $ 2,300a ton, cost $146 a ton; an Asian put option would have cost $100 a ton.

Asian options are growing increasingly popular for metals, and the first ones have now been introduced on a futures exchange - the LME.

against an increase in their fuel bills (as in the case of Chile or Brazil) or against a decrease in their export earnings (as in the case of Mexico). In Mexico, the Government decided to set up an intermediary organization to allow farmers and processors to buy agricultural options. However, overall, use of option markets by participants from developing countries is fairly limited, in particular as regards African companies and Governments. One problem is poor access, although access may improve somewhat as the PTA Bank has been offering agricultural option contracts to exporters and importers in southern and eastern Africa since late 1993.

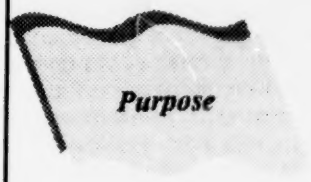
D. Swaps

75. Swaps (see box 14) were developed on the OTC market as a long-term price risk management instrument. With swaps, producers can effectively fix, that is, lock in, the prices they receive over the medium to long term, and consumers can fix the prices they have to pay. No delivery of commodities is involved: the mechanism of swaps is purely financial. In a swap agreement covering a specified volume of a commodity, two prices are involved. One of these prices is variable and is usually expressed in relation to a published price index such as the price of a futures contract. The other is fixed at the time of the swap agreement.

76. Commodity risk management instruments with maturities greater than a year have for a long time been very difficult to acquire. With the increasingly global character of business operations, an increasing need for securing the repayment of loans or the profitability of investments, the deregulation of financial markets and the introduction of new techniques in the financial risk management markets (which paved the way for innovations in the commodity field), commodity swaps started to increase

Box 14

Commodity swaps



- to guarantee income streams of operations or new investments
- obtain easier and cheaper access to capital by securing future cash flows
- lock in long-term prices

Advantages

- combination of price-hedging and securing investments
- long-term
- Tailor-made
- no or less-strict margin calls
- low administrative burden
- known counterparty

Disadvantages

- counterparty risks
- positions are difficult to reverse
- high design/set-up costs
- difficult to assess the "fair" price for the deal
- possibility of benefiting from favourable price movements may be lost

in number during the second half of the 1980s. Initially, banks and a number of trading companies (generally with production or refining interests which allowed them to offset risks by commercial operations) were the only participants. They are still the main participants, but a number of swap brokers traditionally active on the financial swaps market are now entering the commodity field.

77. Most of those active in promoting swaps act only as intermediaries, laying off their risks by offsetting swaps (the risks of a swap with a consumer being compensated by an identical, reverse swap with a producer) or futures transactions. The risks of swap contracts can be offset by rolling over exchange-traded futures to obtain longer-term hedges (that is, regularly selling almost expired futures contracts and buying new ones).[19] There are only a handful of banks and trading houses (Bankers Trust, British Petroleum, Elf, Shell, Phibro Energy, Metallgesellschaft and Marc Rich are the main ones) who are willing to take principal risks. Compared to a swap agreement directly between a consumer and producer, the use of an intermediary has the advantage that the intermediary carries all risks associated with performance of the swap. The producer and consumer still buy and sell the commodity on the open market, but the swap compensates the participants so that in effect they have each locked in a fixed price for the commodity. For an example of a swap agreement with a bank as intermediary, see box 15.

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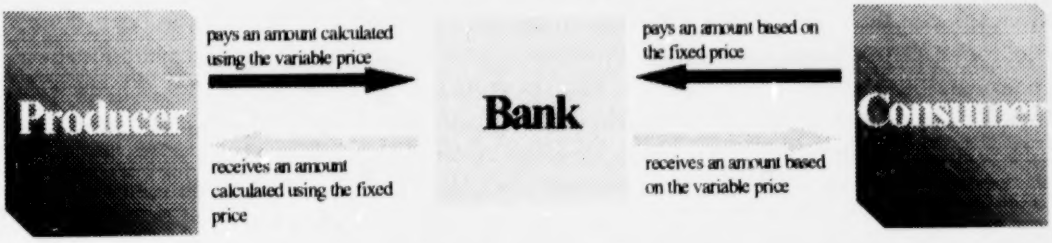
[19] This is evidently not easy; those using these roll-over strategies should also consider the risks they run as a result of their obligation to pay margins on futures positions (as MG Corp., a subsidiary of Metallgesellschaft, found out at great cost in the mid-1990s). Futures contracts have developed in a manner designed to respond to the needs of the OTC market. As longer-term instruments such as swaps are becoming increasingly important, counterparty obligations are becoming more long-term, and the risks run by intermediaries are increasing as is the pressure to find ways to offset these risks. There is therefore growing pressure on exchanges to trade longer-period futures, for all commodities.

Box 15

Example of a swap agreement involving a producer, consumer and bank


Producer
pays an amount calculated using the variable price
receives an amount calculated using the fixed price
Bank
pays an amount based on the fixed price
receives an amount based on the variable price
Consumer

- In practice, only net amounts are paid: by the producer to the bank (or from the bank to the consumer) if the reference price is higher than the fixed price; and by the bank to the producer if the reference price is lower than the fixed price.
- It is possible to integrate an option clause in the contract to permit the producer to profit from price rises, but in the case of commodities this is often prohibitively expensive due to the premium costs of longer-term options. This can be partly mitigated by the producer selling options to the bank (e.g. giving up part of the benefits if prices increase beyond a certain level).
- Swaps are often attractive to lenders or investors, as they provide security for the cash flow of the company to which they are lending finance, and thus the ability of the company to repay a loan or to pay a dividend is improved by providing a long-term custom-designed hedge.

78. As a commodity swap is a purely financial transaction, it has the advantage of allowing the producer and consumer to hedge their price exposure without directly affecting their commodity production, distribution or procurement activities. Thus the participants have a large degree of flexibility to alter their production or consumption patterns to adapt to changing market needs. However, indirectly, these activities are influenced because a company has to generate the cash flows necessary to meet the eventual obligations of the swap agreement.[20]

79. The majority of commodity swaps last from one to seven years. Shorter-term swaps can be arranged when futures or forward markets do not exist to hedge the exposure (e.g. for products not traded on the exchanges). In some rare cases, swap deals are as long as 25 years.

80. The commodity swap market is at present very small in comparison to the interest-rate and currency swap market. It was estimated to have some US$ 40 billion outstanding in late 1991, compared with close to US$ 2 trillion outstanding on interest rate and currency swaps. According to the International Swaps and Derivatives Association, the amount outstanding on interest-rate and currency swaps has increased strongly since then, reaching an amount of about US$ 21 trillion in late

[20] Note that productive activities cannot be fully flexible. For a producer, for instance, if reference prices are higher than the fixed price agreed in the swap arrangement, the producer will need to pay the intermediary. This will not be a problem when the producer has products to sell on the market, but it does make it rather risky to close a production facility at a time of low prices, because prices may rebound with the producer being unable to obtain the necessary cash flow in time to pay his swap obligations. In general, banks providing swaps to a producer (or providing finance to be reimbursed through future commodity sales) insist on a formal undertaking by the producer that it will maintain the relevant business line.

1996; more recent figures for the size of the commodity swaps market are not available. Until 1991, a little under 100 commodity swaps were being completed each year, but the number is reported to have increased considerably since then. The overwhelming majority of these commodity swaps (approximately three-quarters of the market) have been related to petroleum, a product which is widely traded and which involves significant risk exposure for both producers and consumers. Petroleum-related swaps can be based on a wide range of petroleum products. Deals have been done, for example, for jet kerosene and high sulphur fuel oils, as well as for different qualities and locations of crude petroleum; the natural gas market has been growing rapidly for several years. The petroleum swap market can now be considered as liquid (for crude oil even five to seven years forward), with over a dozen intermediaries willing to give price offers. Commodity swaps have also been negotiated for non-ferrous metals, such as copper, aluminium, zinc, lead, nickel, platinum, gold and silver, and for coal. There have been few swaps for agricultural commodities, the only commodities involved being wheat, paper pulp, orange juice, coffee and sugar. A wide range of other commodities have been and are being actively considered for commodity swaps, such as maize, cocoa and chemicals.

81. For some agricultural goods, the existence of liquid and well established futures markets limits the need for such swaps (positions on the futures market can be rolled over to create a "synthetic swap"), but there is also a major technical barrier to the rapid development of swaps for producers in such markets. This barrier lies in the fact that the prices to be used in swaps are difficult to determine when they are based on the prices of futures contracts that are in backwardation most of the time (see box 8) and where the level of backwardation is highly volatile. Thus the potential interest of financial intermediaries and clients alike in using swaps is reduced. Swaps with consumers are much easier to offset by futures transactions than are swaps with producers. When one covers a swap with a consumer by rolling over futures, backwardations provide profits, while contangos result in losses; in the case of a swap with a producer the opposite is the case. Contango costs are limited and can be easily calculated, as storage costs and interest rates are known. But the maximum backwardation costs are unknown: in theory, they can be infinite, and in practice, they depend on the intervention of the exchange regulators. A daily backwardation cost of up to 1 per cent of the value of the underlying commodity is not unheard of. Accordingly, in markets where backwardation prevails, banks and other intermediaries prefer to offset swaps with producers with back-to-back swaps with consumers; so they first have to develop the consumer market before they have enough flexibility to expand the number of swaps with producers.

82. For other products, the demand for swaps is simply not sufficient. Also for some commodities, the absence of suitable price bases makes settlement procedures very difficult; if the price is not based on a very liquid commodity exchange market, one of the participants may manipulate it. Nevertheless, a few commodity swaps are based on price quotations other than from liquid futures markets.

83. For producers, one of the main goals of a swap is to obtain easier and cheaper access to capital, be it investment or loan capital. The swap deal is then imbedded into a wider financing deal, without there being a formal link between the repayment of the loan or investment capital and commodity prices (such as there is in the case of commodity bonds and loans, discussed in section E below). The expected strong growth of commodity swaps involving producers will probably be closely linked to their use as a tool in project finance.

84. The development of the commodity swap market has been particularly strong on the consumer side in developed countries, with banks and oil companies selling fuel swaps to airline companies, and

several metal consumers locking in their long-term prices. These swaps have usually been offset with transactions on the futures exchanges and not with swaps with producers. Eastern European countries are now entering this market. Some fuel swaps have been entered into by producing developing countries (Angola, the Congo, Malaysia, Mexico, Nigeria, and Trinidad and Tobago, among others), and by some developing country importers and airlines (Chile, Ghana and Mauritius, among others). Although demand for metal swaps similar to the Mexicana de Cobre deal discussed below has come from several mining companies in developing countries, the number of actual deals in the metals sector seems very small. The first important swap deals with producers from developing countries and on which sufficient information is publicly available were a copper swap by Mexicana de Cobre, a private Mexican company, and a fuel swap by the Algerian State oil company. For illustrative purposes, these deals are described below. There is very little information available on other, subsequent swap arrangements.

85. A US$ 210 million financing package with a copper swap was developed in 1989 by the New York branch of Banque Paribas for Mexicana de Cobre SA (MdC), a copper-mining subsidiary of Grupo Mexico (see box 16). The loan was the first voluntary hard-currency loan to a private Mexican company since the 1982 debt crisis. The syndicated loan, managed by Paribas, had a term of 38 months and a fixed interest rate of three percentage points above the three-year LIBOR (London inter-bank offered rate). The proceeds of the loan were used to refinance the debt assumed when MdC went public and was acquired by Grupo Mexico in November 1988. The 12 equal quarterly repayments of the loan started in December 1989 from a collateral account set up by Paribas. The finance in this collateral account was secured at an amount sufficient to repay the loan regardless of the level of copper prices over the three-year period through the swap operations as follows:

- A long-term contract was set up with a copper user, SOGEM SA, a subsidiary of Société Générale de Belgique, who agreed to purchase 4,000 tons of copper cathodes each month for the period of the loan from MdC: this amount accounted for about one-third of MdC's production of copper cathodes. SOGEM promised to pay an amount based on the average price for copper on the LME into the collateral account.

- For the same portion of MdC's copper production, MdC agreed to pay Paribas from the collateral account an amount based on a floating copper price (based on daily prices for copper on the LME).

- Paribas agreed to pay into the collateral account an amount based on a predetermined fixed price for the 38-month term of the loan. Paribas' fixed payment amount under the swap matched the amount necessary for the periodic loan repayments.

- Paribas entered the copper futures market to sell copper futures in quantities corresponding to the swap. By means of a systematic quarterly programme of unwinding its futures hedges, Paribas was able to cover its risks due to the difference between the floating and fixed amounts received from payments it made into the collateral account.[21]

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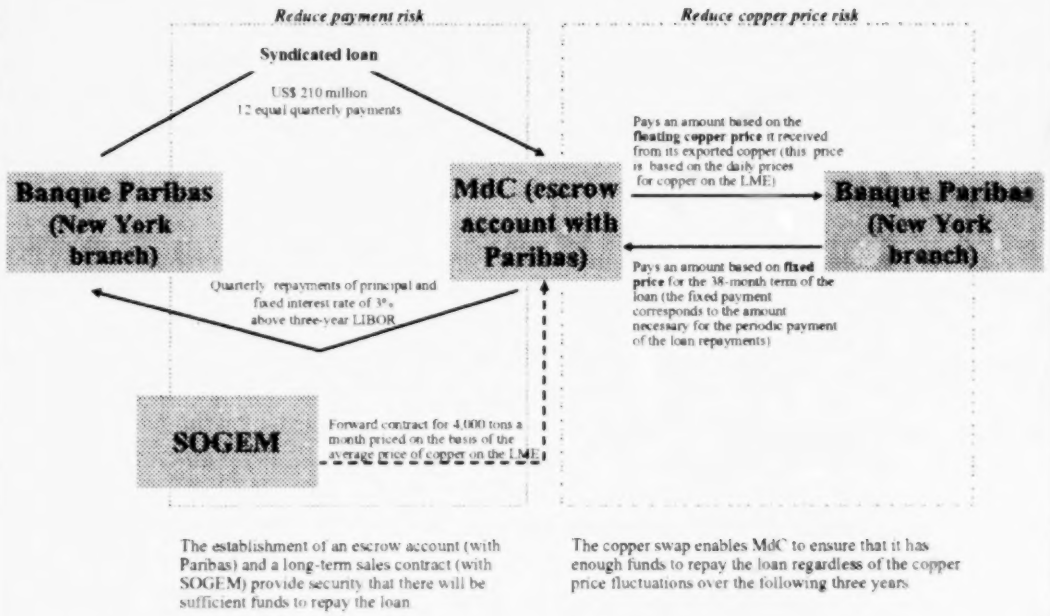
[21] *World Commodity Report*, 3 August 1989; "Commodities blueprint for corporate finance", *Euromoney*, March 1991; "Commodities price swaps", *Institutional Investor*, November 1991; and R. Kohli, "Derivatives move into financing's fast lane", *Metal Bulletin Monthly*, September 1992.

Box 16

The example of Mexicana de Cobre (MdC)


Reduce payment risk
Reduce copper price risk
Syndicated loan
US$ 210 million
12 equal quarterly payments
Banque Paribas (New York branch)
MdC (escrow account with Paribas)
Banque Paribas (New York branch)
Pays an amount based on the floating copper price it received from its exported copper (this price is based on the daily prices for copper on the LME)
Pays an amount based on fixed price for the 38-month term of the loan (the fixed payment corresponds to the amount necessary for the periodic payment of the loan repayments)
Quarterly repayments of principal and fixed interest rate of 3% above three-year LIBOR
SOGEM
Forward contract for 4,000 tons a month priced on the basis of the average price of copper on the LME
The establishment of an escrow account (with Paribas) and a long-term sales contract (with SOGEM) provide security that there will be sufficient funds to repay the loan
The copper swap enables MdC to ensure that it has enough funds to repay the loan regardless of the copper price fluctuations over the following three years

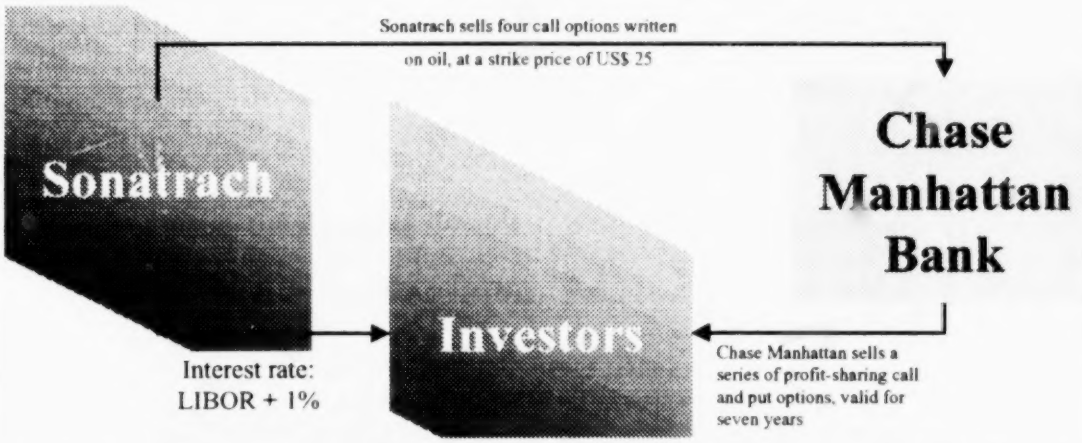
86. A different example is provided by Algeria's State-owned hydrocarbon concern, Sonatrach, which in order to fund part of its investment programme entered into a loan agreement with a syndicate of international banks in November 1989 (see box 17). The loan, coordinated by Chase Manhattan, consisted of a US$ 100 million conventional floating-rate loan (with a seve- year maturity and a four-year grace period) and an options-related swap. With this scheme, Algeria re-entered the medium term syndicated loan market at a significantly reduced cost. The loan was structured as follows:

- Sonatrach paid the investors LIBOR plus 1 per cent; and it sold four call options written on oil (with maturities of 6, 12, 18 and 24 months), at a strike price of US$ 25, to Chase Manhattan.

- Chase Manhattan sold a series of profit-sharing options to the investors, valid for seven years, which gave them a supplementary 0.5 per cent interest for every dollar that the reference price was above US$ 22; and it sold a series of options to the investors, valid for seven years, which gave them a supplementary 0.5 per cent interest for every dollar that the reference price was below US$ 16. This range of US$ 16-22 held for the first year; in the following years it progressively widened to US$ 13-26. The idea behind this was that firstly, investors would be able to benefit of periods of high oil prices; and secondly, that they would also receive a higher interest rate in periods of low oil prices, as a compensation for the higher default risk of Sonatrach during such periods.

Box 17

The example of Sonatrach



Sonatrach itself could not provide the options that investors wanted, as it was impossible for it to pay higher interest rates when its oil earnings were lower, while investors found this essential to compensate them for the higher default risk. The solution was a swap of options between Sonatrach and Chase Manhattan, with Sonatrach selling options at a strike price that it found acceptable (at a level higher than that wished by the investors), and for a period of only two years. In return, Chase Manhattan provided the investors with the options they wanted. It is estimated that the cost of the loan would have been 3-4 per cent above LIBOR without the scheme. This scheme has been described as a model for future developments in commodity-linked finance.[a]

[a] L. Lassiter, "Commodities blueprint for corporate finance", *Euromoney*, March 1991.

E. Commodity bonds and loans

87. Commodity bonds and loans are a complicated set of financial instruments, consisting in effect of a whole range of different mechanisms (see Boxes 18 and 19). The commodity swaps discussed above are often part of a deal that involves commodity-price-linked loans and bonds. These instruments are usually linked to investment projects or debt reschedulings, and are not primarily meant as a means for managing price risk in commodity trade; rather, price risk management elements are built in to provide more security to lenders that the borrowers will be able to meet their commitments, even in times of unfavourable price developments. Thus, commodity bonds and loans can act as a vehicle to obtain access to capital on easier terms.

88. If commodity producers borrow at a fixed rate, they face price risk exposure in the sense that the price of their product may fall below the break-even cost of production. If they borrow at a floating rate, then, in addition to price risk exposure, they face the risk of a rise in interest rates. Commodity bonds and loans can reduce funding costs, and provide a hedge against rising interest rates. If the commodity price rises, the commodity-linked debt will become more expensive to repay but that is in accordance with an increase in revenues, and when price of the commodity falls, the debt will cost less to repay. For example, an aluminium company, concerned about a drop in the price of

Box 18

Commodity loans and bonds

Purpose

- obtain easier access to finance on better terms
- hedge price risks and simultaneously raise investment finance
- debt rescheduling

Advantages

- no initial cash transfer by the issuer
- long-term
- repayment is linked to the risks of the borrower: the price of its commodities
- tailor-made

Disadvantages

- borrower's credit risk
- high volume required due to set-up costs underlying the issuance
- good track record required
- fairly sophisticated distribution network needed for marketing the issue

its product, may issue commodity-linked bonds whose interest rates rise and fall with the price of aluminium. Then, when the company's revenues decrease as a result of a drop in aluminium prices, its cost of borrowing also declines. Commodity bonds and loans act as a natural hedge for future revenues and production.

89. Most commodity bonds issued so far have been linked to gold, silver and fuels; some are issued on aluminium, copper, nickel, coffee and cocoa.[22] The use of such bonds expanded throughout the 1980s, and the approximate value of publicized issues as of 1991 totalled around US$ 4 billion.[23]

90. The primary motivation for a commodity producer to issue a commodity-linked bond is to raise investment capital while ensuring through the use of a single instrument that the investment's return is not affected by changes in the price of the commodity. Therefore, the ultimate objective in using this instrument is to acquire protection from adverse movements in interest rates and spot commodity prices. This has been a particularly powerful motive in the gold industry. In recent years commodity-linked bonds have also been used to pay off debts. The aim is to ensure a positive correlation between all debt service obligations and commodity prices, which reduces the overall risk to the producer.

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[22] See T. Priovolos, "Experiences with commodity-linked issues", in T. Priovolos and R.C. Duncan (eds.), *Commodity Risk Management and Finance*, Oxford, Oxford University Press, 1991. Note also the existence of bonds linked to commodity price indices, such as those issued by Goldman Sachs (by way of its subsidiary J. Aron, one of the world's main commodity traders) in 1991 (see *Wall Street Journal*, 20 May 1991).

[23] This may be a gross underestimate. For instance, the volume of oil-price-indexed bonds and loans that are placed privately or through semi-private placements is far higher than that placed through public offerings. See Intercapital Brokers Ltd, *The Complete Guide to Oil Price Swaps*, London, December 1990.

Box 19

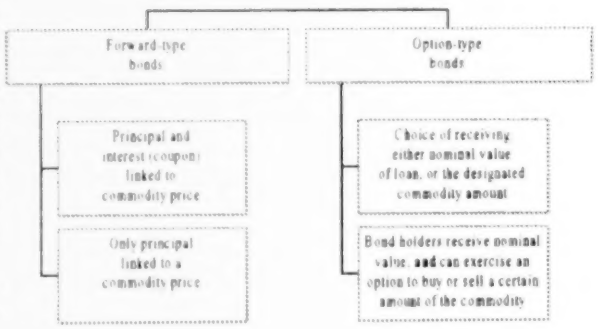
Commodity-price-linked loans and bonds

Commodity-price-linked bonds and loans in reality consist of a large number of non-standardized instruments, often with complicated specifications. There are many ways to tie the repayment of a loan or bond to commodity prices.

Commodity-linked loans are loans which tie the payment of interest and/or principal to the price of a commodity or a basket of commodities. Instead of reimbursing the loan with variable interest-rate payments, the loan is reimbursed with the value-equivalents (using a reference price) of fixed amounts of a commodity.

Commodity bonds are bonds in which the yield to maturity is linked mainly to the price of the underlying commodity. Instead of a fixed interest rate and a fixed amount paid at maturity, the pay-off of a commodity bond's principal and dividends are expressed in terms of the commodity price. There are two types of commodity bonds (see figure below).

In *forward-type bonds*, the principal and/or interest are linked to a commodity price or to a commodity price index. For example, if the principal only is linked, a US$ 1,000 face value gold bond may be repaid at maturity with a sum equivalent to the value of 3.00 troy ounces of gold, while up to maturity, a fixed interest of US$ 70 per year is paid.


Forward-type bonds
Option-type bonds
Principal and interest (coupon) linked to commodity price
Only principal linked to a commodity price
Choice of receiving either nominal value of loan, or the designated commodity amount
Bond holders receive nominal value, and can exercise an option to buy or sell a certain amount of the commodity

With *option-type bonds*, the holder of the bond has the right to buy or sell a commodity at an exercise price, in addition to his conventional bond.

If the bond holder has the choice of receiving either the nominal face value or the designated commodity amount at maturity, the bonds are termed *commodity convertibles* or *indexed bonds*. If the bond holder receives the nominal face value and has the possibility of choosing whether to exercise an option to buy or sell a certain amount of the designated commodity at a predetermined price at maturity or at any predetermined date before that, the bonds are termed *option bonds*.

The forward-type of commodity bonds are often issued for risk-hedging by the company or producer (or country) involved; the option-type bonds are used to reduce the cost of financing (lower coupons).

91. A possible major new area for commodity bonds is their use as part of debt-rescheduling programmes. In 1990, as part of the Brady Plan, banks which agreed to accept lower principal or interest payments on their existing loans to Mexico and Venezuela received new 30-year bonds from the Governments of these countries carrying the right to receive supplementary payments tied to oil export prices. Early in 1991, a United States regulatory agency, the Commodity Futures Trading Commission (CFTC), authorized Uruguay to issue notes in the United States equivalent to commodity options which gave the holders the possibility of receiving payments based on favourable changes in the prices of beef, wool and rice exports, and petroleum imports, again as part of a plan to restructure

foreign debt. In early 1992, the CFTC authorized Nigeria to issue and sell bonds linked to crude oil prices. The Costa Rican debt restructuring scheme uses contingency facilities that are also very close to commodity-linked finance. The advantages are clear: the borrowing country's debt service obligations become higher when its export earnings are higher or import costs are lower. By making it easier for the country to pay, it makes default less likely. It could also result in lower interest rates being charged.[24] However, it should be noted that although commodity-linked bonds can be useful for producer Governments because they are long-term instruments, they are not suited for soft commodity or grain markets. Most of the commodity-linked bonds are launched for a period of five years or more, and some oil-linked bonds have been issued for a ten-year period.

92. Commodity-linked arrangements are becoming increasingly important, including for developing countries. Nevertheless, most deals have so far been done in developed countries: for instance, a major part of the gold production for the past two to three years in Australia, North America and South Africa has been financed by gold loans, and several Western oil companies have issued commodity-linked bonds.[25] The earliest cases involving developing countries were designed to obtain finance on domestic capital markets. In 1980, Semirara Coal Corporation, a Philippines-based coal-mining company, issued coal-indexed convertible securities worth US$ 17 million in local currency. Mexico's state-owned oil company, Pemex, used oil-price-linked bonds, denominated in pesos, as its main source of finance in the early 1980s. Both interest and principal payments on the bonds were tied to export prices for Mexican crude oil. This allowed Pemex considerable protection during times of low prices, albeit at a high cost. In the mid-1980s, a Zambian cotton grower expanded its operations with a loan for which the interest rate was linked to the international prices of cotton.[26] In 1988, Brazil's state-owned mining company CVRD issued two- to four-year bonds, worth $US 268 million in local currency, tied to gold prices. Recent examples include the underwriting of a small loan linked to the price of palm oil in Malaysia by Citibank, and the financing of a copper investment in Papua New Guinea by Metallgesellschaft with finance linked to the price of copper. In 1994, Zimbabwe's Cluff Resources received a large gold loan from the Eastern and Southern African Trade and Development Bank (PTA Bank). Details of a commodity-linked loan to Dubal, Dubai's Government-owned aluminium smelter, are given in box 20.

93. Countries in transition have also entered the game. In September 1993 the Russian Ministry of Finance started selling gold-backed bonds, to obtain relatively cheap finance in the prevailing high-inflation environment. Towards the end of 1995, the European Bank for Reconstruction and Development issued a $US 110 million loan to Slovako AS, a Slovak primary aluminium producer, to finance a new smelter. The repayment of principal and interest were linked to the average price of high-grade aluminium traded on the LME. In 1996, in order to expand and increase its working capital, the Slovak refinery and petrochemicals company, Slovnaft, received a five-year loan for US$ 50 million with the interest rate linked to crude oil prices, and a Polish refinery received a five-year loan for US$ 100 million with the interest rate linked to the price of crude oil.[27]

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[24] See T. Besley and A. Powell, *Commodity-Indexed Debt in International Lending*, World Bank Working Paper, March 1989.

[25] M. Essayyad, "Using commodity-indexed financing to fund OPEC/Alaska's development projects", *OPEC Review*, Winter 1992, Supplement.

[26] J.D. Glen, *How Firms in Developing Countries Manage Risk*, International Finance Corporation Discussion Paper No. 17, World Bank, Washington, June 1993.

[27] G. Essome (Merrill Lynch), "Accessing the international capital market through commodity-linked financing", *Proceedings of the Second African Oil Trade Conference*, UNCTAD/ITCD/COM/Misc.14, Geneva, 1997.

Box 20

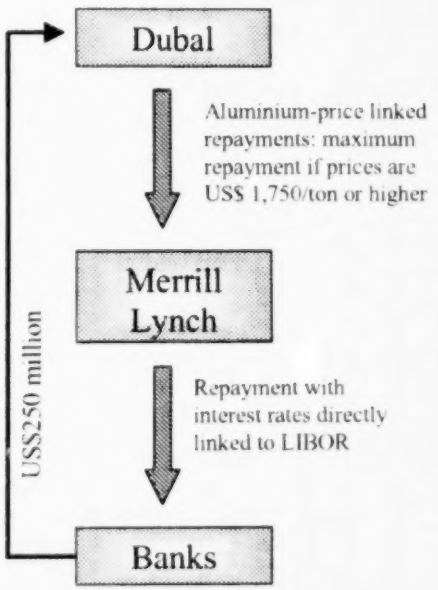
Dubal/Merrill Lynch commodity-linked loan

In 1995, Dubal, Dubai's government-owned aluminium company, required US$ 503 million to increase its capacity. Half of this was needed from banks or the securities marke.

Structure of the deal

In deciding on its borrowing strategy, Dubal's management realized that cashflow management and aluminium price levels would be crucial to the success of the project. If the expansion was financed by a bank loan, and aluminium prices fell, the company's ability to repay the loan would be jeopardized. To avoid this risk, the company used an aluminium-linked syndicated loan, in which liabilities and cash flows were directly linked.

An agreement was signed between Merrill Lynch Capital Services and Dubal, in which Merrill Lynch received the aluminium-linked payments from Dubal, while paying the lenders the $250 million plus interest (equal to the prevailing US$ LIBOR plus 50 basis points, that is, half a percent).


Dubal
Aluminium-price linked repayments: maximum repayment if prices are US$ 1,750/ton or higher
Merrill Lynch
US$250 million
Repayment with interest rates directly linked to LIBOR
Banks

From the perspective of Dubal, the financing consisted of a *commodity bond* and a *synthetic put* embedded in the loan. It worked as follow: drawdown of the US$ 250 million financing was immediate, in March 1995. For reimbursement, there was a two-and-a-half-year grace period, after which the loan would be repayable in six half-yearly instalments. Each instalment is calculated according to a formula which effectively implies that:

- *If the aluminium price falls below US $1,5 00 a ton* (the reference price being the arithmetic average of the LME official cash settlement price for all business days during the previous six months), the reimbursement declines concomitantly (for each US$ that the reference price is below US$ 1,500, the loan reimbursement is US$ 62,400 lower).
- *If the aluminium price is between US$ 1,500 and US$ 1,750*, the amount repayable increases - for the amount hedged (10,400 tons a month), Dubal gives up all benefits of prices above US$ 1,500.
- *If the aluminium price is above $1,750*, Dubal benefits from all further increases in aluminium prices.

The hedging elements

Two main hedging elements were used in the deal:

1. *A swap arrangement* between Merrill Lynch and Dubal, in which Merrill Lynch links Dubal's reimbursements to the income from its expected aluminium production, while giving the members of the loan syndicate a debt service which is not linked to aluminium prices.
2. *A series of options (put options with a strike price at US$ 1,750)* embedded in the deal, which ensured that if aluminium prices increased above US$ 1,750, Dubal's loan repayments would no longer increase, allowing the company to benefit from large price increases. The premium for these options was, in effect, part of the financing.

Benefits of the deal

The deal had four main benefits:

1. It guaranteed a minimum price for the company's production, thereby fixing a minimum net margin and a minimum return on the project.
2. It linked repayment amount with ability to pay, making budgeting easier and reducing the credit risk exposure taken by lenders, leading to more favourable pricing of the loan (lower interest rates).
3. It locked in the borrower's repayment cost.
4. It also gave the company unlimited advantages if prices increase above $ 1,750 (which is the level the company believes that aluminium prices will reach in the medium term).

Source: based on the article "Dubal loan a perfect fit for the project", *Corporate Finance*, 1995.

Annex I

Overview of commodity price risk management instruments

Instrument	Description	Characteristics	Use	Main users
Forward	• an agreement to purchase or sell a specific commodity on a specified future date at a pre-set price • most transactions are OTC, some (mainly for metals, coffee and rubber) are made on forward exchanges • tailor-made contracts matching specific hedging needs are available for OTC contracts	• no initial cash transfer, cash transfer only at maturity • high (two-sided) credit risk involved • an initial position cannot easily be closed before maturity unless the contract is exchange-traded • physical delivery of the commodity is expected • the maturity of available contracts is generally up to one year	• contract made today for the delivery of a commodity in the future, i.e. locking-in a future price • obtaining "forward cover", i.e. simultaneously executing a set of reverse transactions in the spot and forward markets • part of marketing strategy regarding longer-term trade relationships	• market participants who want to establish or maintain longer-term trade relationships • trading partners with a well-established relationship and mutual confidence
Futures	• an agreement to purchase or sell a specific commodity on a specified future date at a preset price • transactions are made in formal exchanges through clearing houses • contract terms are highly standardized (tailor-made contracts are not available)	• initial cash transfer for margin payments • daily cash transfers may be required • minimal (two-sided) credit risk • an initial position can easily and quickly be closed or reversed • physical delivery of the commodity is not necessary • the maturity of available contracts is mostly up to 18 months, sometimes 36 months	• similar to forward contracts, but futures are designed to deal directly with the credit risk involved in locking in prices and obtaining forward cover • hedging price risk • obtaining short-term finance	• market participants whose liquidity allows them to meet the daily variation margin requirements • price hedgers (producers, consumers, processors, traders) and speculators (locals or institutions such as pension funds) • market participants who do not want to worry about their counterpart's creditworthiness
Option	• the right to purchase or sell a specific commodity on or before a specified date at a preset price • transactions are made OTC or in formal exchanges • tailor-made contracts matching specific hedging needs are available for OTC options	• initial cash transfer ("premium") from the buyer to the seller of an option, representing the cost of the option - the option-buyer faces the option-seller's credit risk unless the contract is exchange-traded	• the purchase of an option limits the size of the maximum loss while it does not eliminate the opportunity to take advantage of favourable price movements • the sale of options can be used to valorize inventories	*Option buyers* • presently mainly producers, traders and consumers from developed countries • market participants whose liquidity allows them to meet the (sometimes substantial) initial cash-payment requirement

Instrument	Description	Characteristics	Use	Main users
Option (cont'd)		• commodity options are mostly exercisable into a futures contract on the commodity rather than the physical commodity itself- the maturity of exchange-traded contracts is primarily up to one year • sellers (but not buyers) of exchange-traded options are exposed to margin requirements	*Exchange-traded* • hedging price risk • obtaining short-term finance *OTC* • part of marketing strategy regarding longer-term trade relationships	*Option sellers*: • market participants with uncertain hedging needs • market participants whose production and delivery terms are flexible and who want to valorize their inventory
Swap	• agreement to exchange specified cash flows at specified intervals • a series of cash-settled forward contracts strung together • transactions are mostly made directly with a bank or large trading company • contracts are tailor-made, matching specific hedging needs	• initial cash transfer and variation margin payments may be required • (two-sided) credit risk involved • physical delivery is not expected, purely financial instrument • the maturity of contracts is from six months to 15 years (mostly from one to four years)	• locking-in future prices for a long period	• market participants executing price hedging associated with financial deals • consumers wishing to protect their long-term price competitiveness by locking-in their input costs
Commodity-linked loan	• agreement to link the repayment amount of principal and/or interest to the price of a specific commodity or to an index of commodity prices • combination of a bank loan with a commodity swap • transactions are made through brokers • contracts are tailor-made, matching specific hedging needs	• no initial cash transfer by the borrower • the lender faces the borrower's credit risk • physical delivery is not expected - it is a purely financial instrument • long-term maturity of contracts	• mainly linked to investment projects or debt rescheduling (at a company or country level), often as a vehicle to get easier access to capital on better terms • hedging price risk and raising investment capital using a single instrument	• market participants who want to ensure a positive correlation between debt service requirements and commodity prices

Instrument	Description	Characteristics	Use	Main users
Commodity bond	*Forward type* • agreement to link the repayment amount of principal (this corresponds to the combination of a conventional bond with a commodity forward contract) and/or coupon payments (this corresponds to a combination of a conventional bond with a commodity swap) to the price of a specific commodity or to an index of commodity prices *Option type* • the bond-holder owns the right to purchase or sell a specific commodity on or before a specified date at a pre-set price • combination of a conventional bond with a commodity option *Both types* • transactions are made through brokers • contracts are tailor-made, matching specific hedging needs	• no initial cash transfer by the bond issuer • the lender faces the borrower's credit risk • physical delivery is not expected - it is a purely financial instrument • long-term maturity of contracts	• mainly linked to investment projects or debt-rescheduling (at a country or company level), often as a vehicle to get easier access to capital on better terms • hedging price risk and raising investment capital using a single instrument	• market participants who want to ensure a positive correlation between debt service requirements and commodity prices • developing countries (e.g. Mexico, Uruguay, Venezuela) whose external debt has been restructured

Annex II

Commodity exchanges around the world

Virtually all of the futures exchanges in the **United States** date from the late nineteenth or early twentieth century. They all started as commodity exchanges, but since the early 1980s trade in financial futures has become more and more important for most of them. The Chicago Board of Trade is the world's largest futures exchange, with a volume of 243 million contracts in 1997 (17 per cent of total world volume). The Chicago Mercantile Exchange, the world's third-largest, accounted for about 14 per cent of world volume, while the New York Mercantile Exchange (NYMEX), the world's sixth-largest, accounted for almost 6 per cent. Among the large exchanges, NYMEX is the only one trading solely commodities, and is the world's largest commodity exchange.

Until quite recently, the United States exchanges used to account for the major part of world futures and options trade. As the table below shows, they were overtaken by the rest of the world in 1993.

Legend

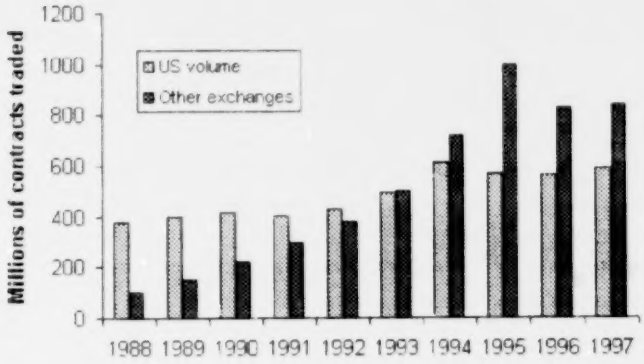
Country has one or more active commodity futures exchanges.

Country has one or more exchanges active in the physical trade of commodities, for immediate or forward delivery.

There are, or have been, plans for the introduction of a commodity exchange.

Table A.1

Volume of trade of United States and other exchanges



The exchanges in **Canada**, also long-established, are of fairly minor importance; the largest exchange trading commodities, the Winnipeg Commodity Exchange, was the world's 44th-largest futures and options exchange in 1997, accounting for 0.13 per cent of world market trade. Several studies have been carried out since 1990 on the possible introduction of a commodity futures exchange in **Mexico**; initiatives to introduce one have been taken in at least three different states. However, despite the detailed feasibility studies, no organized commodity futures exchange has yet been created.

Most of the commodity exchanges in Central and South America trade physical commodities, for immediate or forward delivery. Nevertheless, the region is also home to one of the world's oldest commodity futures exchanges, the Bolsa de Cereales in **Argentina**, which dates from 1907 (three other commodity exchanges are also active in the country). The region's main

commodity exchange is the **Bolsa de Mercadorias & Futuros**, in **Brazil**. Although the exchange was only created in 1985, it was the world's fourth-largest futures exchange in 1997, with more than 122 million futures and options contracts traded (although commodity futures and options only accounted for less than one tenth of its turnover). There are more than 20 other commodity exchanges operating in Brazil, spread throughout the country. They trade largely in commodities for immediate or forward delivery, but through an electronic network (which links most of the country's exchanges) they also make it possible to trade in futures contracts.

The exchanges in **El Salvador**, **Honduras**, **Nicaragua**, **Costa Rica**, **Panama**, **Colombia**, **Ecuador**, **Peru** and **Bolivia** were mostly created in response to the liberalization of domestic trade, as a mechanism for the organization of domestic commodity trade flows. The oldest of these, in Colombia, dates from 1973, and the Ecuador dates exchange from 1986, but the others have all been introduced since 1992. Most of the products traded are agricultural (with some processed products traded in a few countries), but the Government of Colombia is looking at the possibility of introducing a commodity exchange for emeralds. The trading possibilities offered by the exchanges vary widely. Most provide a forum for the trade in physical commodities, but some also enable forward trading; in Colombia, the exchange also trades the "credit" part of warehouse receipts (in Latin America, warehouse receipts consist of two parts, one which gives rights to the commodities, and one which is used for credit purposes).

The creation of a commodity futures exchange was proposed by a major private sector group in **Chile** in the late 1980s; the proposed exchange would trade in domestic foodgrains and in fishmeal, but plans for it have not yet been finalized. In **Paraguay**, the Government is considering the possibilities for the introduction of an exchange. Progress towards the introduction of an exchange is quite advanced in the **Dominican Republic**; it is planned to introduce warehouse receipt trading for beans and coffee.

Europe is home to both some of the world's oldest and some of the world's newest commodity exchanges. Two of the three commodity exchanges in the **United Kingdom**, the London International Financial Futures Exchange, Liffe (or rather, the commodities department of the Liffe, which was an independent exchange until a merger in 1996) and the London Metal Exchange can trace their history back to the nineteenth century. The third, the International Petroleum Exchange, was formed in response to the change in oil marketing and pricing practices of the late 1970s. Exchanges in **France** and **the Netherlands**, although of less importance for commodities than those in the United Kingdom exchanges, also have long histories. In terms of size, the Liffe is the world's second-largest futures exchange (accounting, in 1997, for one-seventh of world market futures and options volume); the Marché à Terme International de France and the London Metals Exchange each

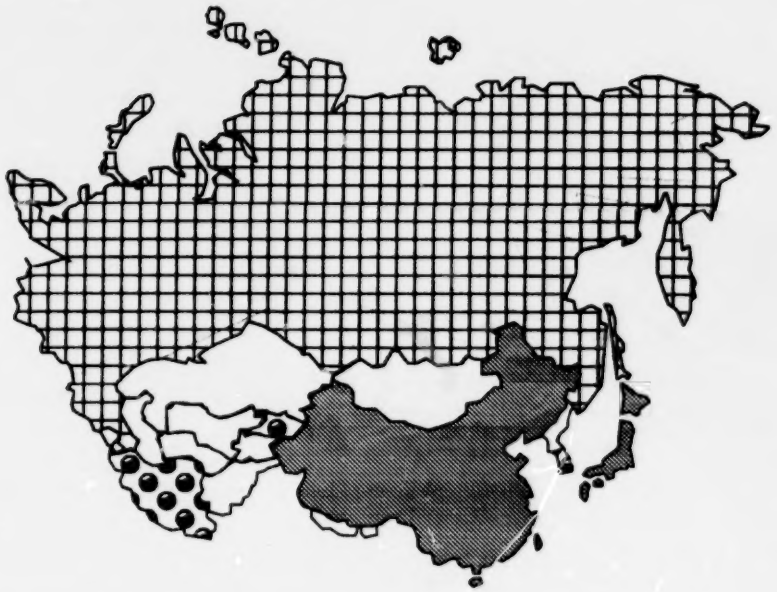
accounted for some 4 per cent of world turnover. There are also commodity exchanges of a more traditional kind, oriented towards physical trade, in these countries, notably the French Rungis market for trade in fruit and vegetables, and the Dutch flower auction in Aalsmeer.

Another country where exchanges have existed for a long time is **Turkey**. More 20 of them are engaged in active commodity trade (others are called exchanges, but in fact, only act as centres for the registration of commodity trade transactions); the oldest, in Izmir, traces its origin back to 1891. These exchanges act as physical trading centers, to which a range of commodities are brought for inspection and immediate sale. Some of these exchanges are now looking at the possibility of introducing more sophisticated forms of trade, based on warehouse receipts or even futures contracts (the Izmir Cotton Exchange expects to launch a cotton futures contract in the course of 1998).

Since 1990, many new commodity exchanges have sprung up in Europe. In **Germany** and **Spain**, sophisticated electronic exchanges have been created to trade agricultural commodities (that is, unlike the older exchanges in the United Kingdom, France and the Netherlands, there is no open-outcry floor; rather, buying and selling orders are executed through a computer system). In **Sweden** and **Finland**, the financial contracts traded on electronic exchanges were supplemented 1996 by one for paper pulp. In **Slovenia**, another electronic exchange, the Commodity Exchange of Ljubljana started trading in 1995; it offers a range of currency futures contracts, and two grain futures contracts. While trade in all of these new futures exchanges and new futures contracts has been quite limited so far, in **Hungary**, the Budapest Commodity Exchange, created in 1990 (as an open-outcry exchange), has been quite successful, ranking in 1997 as the world's 30th-largest commodity exchange.

Other commodity exchanges, not trading futures contracts, have been created since 1990 in **Romania**, **Bulgaria**, **Ukraine**, **Lithuania** and **Estonia**. With the exception of the Romanian Bursa de Marfusi (one of the three exchanges in the country), most of them concentrate on organizing trade for immediate physical delivery. The Bursa de Marfusi also trades in forward delivery contracts.

In the **Czech Republic**, there have been plans since 1994 to create a commodity exchange to trade precious and non-precious metals, fuels, minerals, ores, timber, paper products and construction materials - a range of products quite different from that normally introduced in countries with liberalizing economies (where exchanges tend to focus on agricultural commodities). In **Poland**, where several commodity exchanges were active in the first half of this century, the reintroduction of exchanges, which would be trading on the basis of warehouse receipts, is under serious consideration; and the United States Chicago Board of Trade has signed an agreement to assist in the creation of a futures exchange in Warsaw.



At the beginning of this century, there were over a hundred commodity exchanges in **Russia**. The early 1990s saw a spate of introductions of new exchanges - according to one estimate, more than 270 exchanges were created between 1990 and 1993. Several commodity futures contracts have been formulated (the first one, an aluminium contract, was launched by the Moscow Commodity Exchange in late 1992), but trade has not been very active (market users concentrated on stock, currency and interest-rate futures). Several exchanges are reported to have plans to move from physical trading in commodities to futures trading.

The case of **China** is discussed in the main text (see box 1). After consolidation, only 14 of the more than 40 commodity exchanges created since 1992 are still operational, and further consolidation is likely.

Futures exchanges in **Japan** have also gone through a process of consolidation since 1993, and only 8 remained in 1997 (down from 17 just four years earlier). The largest are the Tokyo Commodity Exchange and the Tokyo Grain Exchange, each accounting for almost 2 per cent of world futures and options turnover.

The creation of commodity exchanges has been considered in **the Islamic Republic of Iran** and **Kyrgyzstan**; these would be physical exchanges, to meet the needs of farmers, commodity traders and processors in the context of agricultural liberalization. In **Taiwan Province of China** and the **Republic of Korea**, plans to create commodity futures exchanges have been on the table for quite some time.

The case of **India** has been discussed in the main text (see box 2); it has had active commodity exchanges since the beginning of this century, and some of these exchanges are starting to look beyond the country's borders. In the **Philippines,** the Manila International Futures Exchange was active from 1985 to 1996, but was then temporarily closed down by government regulators; trade is expected to start again in 1998.

Private-sector groups in **Pakistan** have called for the re-establishment of a cotton exchange; a cotton exchange functioned in Karachi until the 1930s. In **Thailand**, a project to start a commodity futures exchange in rice, rubber and a number of other commodities has been the subject of debate, including in the country's Parliament, since the early 1980s, but little progress has been made so far. In **Sri Lanka**, the Government is looking at the possibilities of an exchange for both domestically traded and export commodities, including tea.

Australia, **New Zealand**, **Malaysia** and **Singapore** all have active commodity futures exchanges. The Sydney futures exchange was the world's 11th-largest in 1997. Singapore is home to two exchanges, with the Singapore International Monetary Exchange (which trades fuels and gold alongside a range of financial futures) accounting for 1.6 per cent of world market futures and options volume (making it the world's 15th-largest exchange in 1997). The New Zealand Futures Exchange and the Kuala Lumpur Commodity Exchange were ranked 48 and 51, respectively, in the 1997 ranking of world futures exchanges by trading volume.

In **Indonesia**, the introduction of a commodity exchange has been under discussion since the early 1980s. A law permitting the introduction of such an exchange was signed in December 1997, and the creation of an exchange during 1998 or 1999 is likely.

The only active commodity futures exchange in Africa and the Middle East is in **South Africa**. While for a long time the South African Futures Exchange only traded financial futures and gold futures, it introduced a range of agricultural futures contracts in 1997 for domestically traded commodities of which trade was being liberalized, namely, maize and livestock. In 1997, the exchange traded 11.5 million futures and option contracts, making it the world's 22nd largest exchange. Maize contracts are also traded on new exchanges in **Zambia** and **Zimbabwe**, and the Zimbabwe Agricultural Commodity Exchange also offers wheat contracts, but these are contracts for immediate or forward delivery rather than futures contracts. In **Kenya**, an agricultural commodity exchange was established in 1997, as a forum for trade in spot and forward contracts for a range of commodities.

A number of other countries are looking into the possibility of introducing commodity exchanges. In **Côte d'Ivoire**, the Government is hoping to introduce a commodity exchange trading in robusta coffee by October 1998, with cocoa to be added in October 1999; the form that this exchange will take is not clear, but considering the predominance of the Liffe in futures trade in robusta coffee and cocoa, it is likely that contracts for physical delivery and contracts based on warehouse receipts will be traded, rather than futures contracts. In **Egypt**, industry groups wish to revive the Alexandria Cotton Exchange, which was abolished by the Government in the 1950s. Exchange initiatives in **Nigeria** and **Uganda** are focusing on both domestically traded and exported commodities, while in **Morocco**, private-sector groups are looking at how domestic trade liberalization would affect the introduction of contracts traded on a commodity exchange. In the Middle East, a proposed exchange in the **United Arab Emirates** would be internationally oriented, trading a range of contracts based on warehouse receipts.

Annex III

Overview of commodity futures contracts

(an asterisk indicates that the contract has been introduced, or the market started, since 1990)

Commodity	Countries where these futures are traded	Remarks
Energy		
Crude oil	USA, UK, Singapore	USA and UK contracts provide the reference prices for international oil trade
Fuel oil	Singapore	Regional use
Gas oil	UK	"
Heating Oil	USA	National relevance
Gasoline	USA	"
Propane*	USA	"
Natural gas*	USA, UK	Series of contracts for use within regions of the USA, or in the UK
Electricity*	USA, Australia, Finland	Series of contracts for use within regions of the USA; national contracts in Australia and Finland
Metals		
Aluminium	UK, Japan*, China*	UK contract of international importance
Copper	UK, USA, China*	UK contract of international importance; USA contract also used for Latin America
Nickel	UK, China*	UK contract sets international reference price
Zinc	UK, China*	"
Tin	UK, China*	"
Lead	UK, China*	"
Gold	USA, Singapore, Japan, South Africa, Brazil, Canada, Belgium*	Major price determination is still OTC (London Gold Fixing)
Silver	USA, Japan, Canada, the Netherlands	Contracts are internationally used
Platinum	USA, Japan	"
Palladium*	USA, Japan	"
Antimony*	China	National contract
Magnesium*	China	"

Commodities	Countries where these futures contracts are traded	Remarks
Agricultural raw materials		
Cotton	USA, Brazil	National contracts, some international use
Cotton yarn	Japan, China*	National contracts
Hessian	India	National contract
Rubber	Singapore, Japan, China*	Singapore contract is regionally used
Lumber	USA	National relevance
Oriented strand board	USA	"
Plywood*	China	"
Paper pulp*	Sweden, Finland	International relevance
Dried cocoon	Japan	National relevance
Raw silk	Japan	"
Wool	Australia	"
Woollen yarn	Japan	"
Tropical beverages		
Coffee (arabica)	USA, Brazil	USA contract sets international reference price
Coffee (robusta)	UK, Singapore, Brazil, China*	UK contract sets international reference price
Cocoa	USA, UK, China*	Both USA and UK contracts of international importance
Livestock and livestock products		
Live cattle	USA, Brazil, Argentina	National contracts
Live hogs	USA, the Netherlands, Germany*, Hungary	"
Beef	USA, South Africa*	"
Pork bellies (bacon)	USA	National contract
Cheddar cheese*	USA	"
Butter*	USA	"
Dairy milk*	USA	"

Commodity	Countries where these commodities are traded	Remarks
Grains		
Wheat	USA, UK, France, Australia, Argentina, Canada, Hungary,	USA (Chicago) contract of major international relevance. Others are national contracts.
Maize	USA, Japan, Hungary, Argentina, Brazil, South Africa*, Slovenia*	"
Barley	USA, UK, Canada, Hungary, Slovenia*, China*	National contracts
Oats	USA, Canada	"
Wheat flour	Hungary	National contract
Rice	USA	"
Beans, oils and oilseeds		
Rapeseed/canola	France*, Canada	French contract is internationally oriented
Flaxseed	Canada	National contract
Feed peas	Canada	"
Azuki beans	Japan	"
Red beans	Japan	"
Black seed*	Hungary	"
Castorseed	India	"
Peanuts*	China	"
Soybeans	USA, Argentina, Brazil, Japan	USA contract of large international importance
Soybean oil	USA	"
Soybean meal	USA	"
Palm oil	Malaysia, China*	Malaysian contract sets international reference price
Sunflower seed	Argentina	National contract
Others		
Sugar	USA, UK, France, Japan, Brazil*	USA contract sets international raw sugar prices, UK contract white sugar prices
Gur	India	National contract
Potatoes	USA, UK, France, India, the Netherlands, South Africa*	National contracts
Shrimps*	USA	International use
Pepper	India	Internationally oriented
Turmeric	India	National use
Orange juice	USA	Use by USA and Brazil
Oranges*	Spain	National contract
Green beans*	China	"
Nursery stock (plant materials)*	USA	"

Annex IV

List of UNCTAD publications on commodity price risk management and collateral finance

Technical and regulatory conditions influencing participation in, and usage of, commodity exchanges by both buyers and sellers of commodities (UNCTAD/COM/16), April 1993.

Contribution to the improvement of the functioning of commodity markets, analysis of ways of improving the efficiency and use of existing mechanisms for the management of risks arising from commodity price fluctuations (TD/B/CN.1/10).

Contribution to the improvement of the functioning of commodity markets: proposals of the Group of Experts on Commodity Exchanges (TD/B/CN.1/10/Add.1), September 1993.

Risk distribution after liberalization of commodity marketing and problems of access to risk management markets for developing country entities - illustrated by the example of coffee in Africa (TD/B/CN.1/GE.1/2), August 1994.

Counterpart and sovereign risk obstacles to improved access to risk management markets: issues involved, problems and possible solutions (TD/B/CN.1/GE.1/3), August 1994.

Report of the ad hoc group of experts on risk management in commodity trade (TD/B/CN.1/GE.1/4), November 1994.

A survey of commodity risk management instruments (UNCTAD/COM/15/Rev.1), December 1994.

N. Budd (White & Case), Legal and regulatory aspects of financing commodity exporters and the provision of bank hedging line credit in developing countries (UNCTAD/COM/56), February 1995.

Using risk management in grain trade: implications for developing countries (CCP:GR 95/4), March 1995.

S. Gazanfer (Exporters' Union of the Aegean Region, Izmir), Guidelines for facilitating access to risk management markets through the stimulation of local and regional exchanges: the case of cotton in the Near East/CIS/Pakistan (UNCTAD/COM/65), September 1995.

Feasibility study on a worldwide pepper futures contract (UNCTAD/COM/64), October 1995.

Minerals and fuels price risks in Southern Africa, and possibilities for risk management (UNCTAD/COM/69), October 1995.

New types of non-trade related participation in commodity futures markets (UNCTAD/COM/83), June 1996.

Collateralized commodity financing - with special reference to the use of warehouse receipts (UNCTAD/COM/84), July 1996.

Sub-Saharan Africa's oil sector: situation, developments, and prospects (UNCTAD/COM/89), October 1996.

Managing price risks in India's liberalized agriculture: can futures markets help? World Bank/UNCTAD (Report No. 15453 IN), November 1996.

Fuels price risk management - a manual (UNCTAD/COM/MISC.100), November 1996.

Metals price risk management - a manual (UNCTAD/COM/MISC. 101), November 1996

Company control and strategy issues - the basic considerations for the sound use of market-based risk management instruments (UNCTAD/COM/MISC. 102), December 1996.

Sub-Saharan Africa's oil sector: situation, developments and prospects (UNCTAD/COM/89), April 1997.

Emerging commodity exchanges: from potential to success (UNCTAD/ITCD/COM/4), February 1997.

Proceedings of the Second African Oil Trade Conference - Business opportunities in the deregulated African oil market (UNCTAD/ITCD/COM/Misc.14), November 1997

Government policies affecting the use of commodity price risk management and access to commodity finance in developing countries (UNCTAD/ITCD/COM/7), November 1997.

Une approche integrée de la gestion des risques de production et de commercialisation dans le secteur primaire des pays en développement (UNCTAD/ITCD/COM/8), December 1997.

Examination of the effectiveness and usefulness for commodity dependent countries of new tools in commodity markets: risk management and collateralized finance (TD/B/COM.1/EM.5/2), February 1998.

The feasibility of a tropical hardwood plywood futures contract (UNCTAD/ITCD/COM/12), March 1998.

The role of collateralized finance in funding the commodity sector (UNCTAD/ITCD/COM/14), forthcoming.